

**E-PSYBERMATRIX:
PSYCHOLOGICAL PROFILE WEB BASED
EXPERT SYSTEM SOFTWARE**

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WEB BASED EXPERT SYSTEM SOFTWARE

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E-PSYBERMATRIX:
PSYCHOLOGICAL PROFILE WEB BASED
EXPERT SYSTEM SOFTWARE

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A project report submitted in partial fulfillment of the
requirements for the award of the degree of
Master of Science (Information Technology Entrepreneurship)

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APRIL 2007

I declare that this project report entitled, “E-PSYBERMATRIX: PSYCHOLOGICAL PROFILE WEB BASED EXPERT SYSTEM SOFTWARE” is the result of my own research except as cited in the references. The project report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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Special dedicated to my father, mother and all sisters and brothers ,

SYED YAHYA BIN SYED ABD. RAHMAN AL-QUDSI
SHARIFAH RAHIMAH BTE SYED MAHDZAR AL-KHERED

SHARIFAH UMMY KALTHOM SYED YAHYA
SYED AHMAD REDZUAN SYED YAHYA
SHARIFAH FATIN HAMAMAH SYED YAHYA
SYED ABDUL FATTAH SYED YAHYA
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SYED ABDUL HADIE SYED YAHYA
SYED AMAN SYED YAHYA
SHARIFAH MAYA PUTRI SYED YAHYA
SYED ABDUL RAZAK SYED YAHYA
SYED SALEHUDDIN SYED YAHYA

& to my beloved fiance,

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ABSTRACT

The past decade has witnessed a rapid expansion of the Internet. This revolutionary communication network has significantly changed the way people conduct business, communicate, and live. This is why the report tries to focus on how the computer and internet technology can be used to develop e-Psybermatrix: Psychological Profile Web Based Expert System software. The report includes topics such as background problem and solution of psychology profiling in Malaysia, literature review on current practice, methodology that needed in the development and initial finding of technical design. Special attention is paid to business plan that defines commercial value of this State-of-the-Art Technology. The target web application in this development is Personality Profile, Career Interest Profile, Stress Profile, Entrepreneur/Technopreneur Profile, and Psychological Profile Knowledge-base Management System. The report also covers issues specific to areas of practice such as psychological, industrial/organizational, educational, and personality. The most salient conclusion from this report is that the powerful of computer science as an enabler, particularly those regarding the effective usage of psychological profile. Still, new methods made possible by emerging technologies such as Java 2 Enterprise Edition (J2EE), Unified Modelling Language (UML), Web Based Expert System Methodology and Open Source will push the boundaries of existing psychometric theory and it is up to practitioners to test and expand the limits of psychometrics to keep pace with these innovations. This project encourages practitioners to think creatively about how their research and practice can be improved by Internet based profiling. Although there are many issues that await resolution, practitioners should look forward to this new medium with excitement and enthusiasm towards maturity, quality, and productivity of human capital in the future.

ABSTRAK

Internet telah berkembang pantas sejak sedekad yang lalu. Revolusi rangkaian ini secara berkesannya telah mengubah cara hidup manusia menguruskan perniagaan dan berkomunikasi. Ini menjadi sebab mengapa laporan ini cuba memberi fokus ke atas bagaimana teknologi internet dan komputer digunakan bagi membangunkan e-Psybermatrix: Perisian Sistem Pakar Profail Psikologi Berasaskan Web. Laporan ini mengandungi topik-topik seperti latarbelakang masalah profail psikologi di Malaysia serta penyelesaiannya, kajian literatur ke atas amalan semasa, metodologi yang diperlukan dalam pembangunan dan dapatan awal rekabentuk teknikal. Perhatian khas diberikan kepada rancangan perniagaan yang mentakrifkan nilai komersial teknologi *State-of-the-Art* ini. Web aplikasi yang disasarkan dalam pembangunan ini adalah seperti Profail Personaliti, Profail Minat Kerjaya, Profail Stress, Profail Entrepreneur/Technopreneur, dan Sistem Pengurusan Pangkalan Pengetahuan Profail Psikologi. Laporan ini juga meliputi isu-isu peramalan yang berkait rapat dengan bidang psikologi, industri/organisasi, pendidikan, dan personaliti. Kesimpulan yang dibuat dalam laporan ini adalah untuk membuktikan sains komputer sebagai pemangkin, terutama bilamana ianya merujuk kepada keberkesannya dalam penggunaan profail psikologi. Malah, kaedah baru ini juga dapat dilakukan dengan gabungan teknologi seperti Java 2 Enterprise Edition (J2EE), Unified Modelling Language (UML), Metodologi Sistem Pakar Berasaskan Web dan Sumber Terbuka yang mana ianya mampu melebarkan sempadan teori psikometrik yang wujud dan ianya terpulang kepada pengamalnya untuk menguji dan seterusnya mengembangkan limitasi psikometrik agar ianya selari dengan inovasi ini. Projek ini menggalakkan pengamal-pengamalnya untuk berfikir secara kreatif tentang bagaimana penyelidikan mereka boleh ditingkatkan menerusi profail berasaskan internet. Walaupun terdapat isu yang akan timbul, mereka haruslah memandang ke depan dengan semangat dan kesungguhan ke arah membangunkan modal insan yang matang, berkualiti serta produktiviti pada masa hadapan.

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CHAPTER I

PROJECT OVERVIEW

1.1 Introduction

The impact of e-commerce and the transition to k-economy nowadays become reasons why the psychological profile instruments more readily available via the internet. Even though the issues arise concerning test reliability, validity, administration, item security, and test-taker confidentiality, internet profiling still growth and created much interest. The benefits of Internet profiling are speed, cost, and convenience. Profiling over the Internet provides rapid communication of findings to clients, patients, researchers, and the public. It also allows researchers to collect data rapidly, conveniently, and at lower costs than in face-to-face research settings. Internet profiling is cheaper and more efficient; it saves valuable time and provides results more rapidly and easily compared to face-to-face profiling. Benefits of Internet profiling also include sensitization and familiarization of profiling to potential clients and the presentation of profile materials in a consistent and uniform manner. The more those potential clients become familiarized with these procedures, the more comfortable their approach to the profiles can be, reducing spurious sensitization and situational effects.

Internet profiling is also beneficial in that it allows patients in rural settings to be profiled, where it would be difficult or impossible to travel to a profiling centre or to the office of a profiling professional. Internet profiling is of value to patients who lack transportation to such sites, or to those who cannot travel because of physical limitations. In addition, profiles may be presented in a precise manner or in interesting and novel ways, so that the client's attention to the profiling task is enhanced, compared with face-to-face administration.

1.2 Background of Problem

Regarding to the current practise of psychological profile in Malaysia, most of the practitioners and organization deliver their service manually. It is difficult for users to get their services due to time constrain and higher charges. Although that there are many website on psychological profiling that available on the Internet now, but the content and the result are not based on the scientific study about Malaysian values, culture and norms. So this is hard for user to analyst their real potential and fulfilled their needs. This is also reasons why the conventional service is not fully utilized by the community in Malaysia [1].

There are also cases among the individual especially the SPM and STPM students that are facing problems in selecting suitable educational courses for further studies. From the study of counselling and career centre in IPTA and IPTS, there are under graduates try to converting their study to another course because they feel that the course are not appropriate with their career goal, values and self satisfaction [1].

Besides that, the evaluation of entrepreneur/technopreneur for the loan or training application become more complicated because of uncertainty occurs in the selection process. The structuring and staff recruitment also become complex issues for the employer to define the best candidate who can be hired. The current process is been done manually using multiple approaches such as evaluation on candidate background education, experience and face-to- face interview. Therefore, there are limitations due to the process. In some cases, there are certain people feel that the job is not suitable with their character. This will also give an impact to the organization quality and productivity.

In the well developed countries, psychology profiling approach has been widely using as a supportive tool in the psychological, industrial/organizational, educational, and personality. This tool is useful to benchmark human capital development towards generating economic growth.

1.3 Project Goal

To develop web application psychological profile expert system software that able to handle the process of profiling via internet and at the same time use the knowledge-base from the domain expert to generate diagnosis analysis report and keep the related records in the database.

The target users of this software are individuals, students, professionals, parents, counsellors, human resource managers, trainers, and administrators.

1.4 Project Objectives

- 1.4.1 To provides an objective and relevant feedback to target user in terms of individual's personality, values and self perception
- 1.4.2 To build awareness for the Malaysian community in terms of identifying the individual's area of strengths and weaknesses for promoting self improvement
- 1.4.3 To provide profiling practitioners the opportunity to enhance their profiling competencies and their professionalism
- 1.4.4 To provide an important psychological tool for educational and industrial/organizational to assist their students, staffs or job applicants for academic advising, personal training or recruitment purposes.

1.5 Project Scope

- 1.5.1 To develop Personality Profile module that focus on item construction, combination trait analysis and training suggestion
- 1.5.2 To develop Career Interest Profile module focus on item construction, training suggestion, occupational and educational dictionary
- 1.5.3 To develop Stress Profile module that focus on item construction, advisory system and treatment suggestion
- 1.5.4 To develop Entrepreneur/Technopreneur Profile that focus on item construction and diagnosis analysis report

- 1.5.5 To develop Psychological Profile Knowledge-based Management System that focus on interpretation in the diagnosis analysis report.
- 1.5.6 To develop web application psychological profile expert system software using the combination technology of Web Based Expert System Engineering Methodology (WebEX), Object Oriented Design, Unified Modelling Language (UML), Java 2 Enterprise Edition (J2EE), Apache Tomcat Application Server and MySQL database tool.

1.6 Importance of Project

Psychology profiling via internet present several clear advantages over standardized paper-and-pencil tests. First, disposable materials are saved. This advantage has implications for both short and long-range costs, for convenience of test administration, and for environmental protection. Second, because the tests are fully automated, they are more standardized in terms of test instructions and time-keeping. Third, precise scores can be calculated very rapidly, with unfortunate common human mistakes obviated and much time saved, especially in complicated-to-score tests and inventories. Fourth, scores may be automatically and easily added to a test's database to adjust norms and to be used for research. This advantage, too, may save considerable expense in terms of labour costs. In addition, the very availability of data sets may encourage research. Fifth, test-takers have the advantage of receiving immediate, objective, expert-based narrative feedback of their test findings. Moreover, if a complicated inventory is administered, a comprehensive, automated evaluation may be provided instantly, as well.

1.7 Chapter Summary

Two basic procedures exist for computerized testing: (a) simple conversion of paper-and-pencil tests into computerized form and (b) more advanced computerized adaptive testing. In the former case, test items and instructions are simply typed into a computer program. The program presents the instructions and trial or sample items to test takers on a computer screen; respondents mark their responses through mouse clicks. Test takers may move forward or backward along the items, change answers, and do anything they would have done on an equivalent paper-and-pencil test. The computer program also monitors the testing time of time-limited tests. Upon completion of the administration of the test, the program computes raw and standardized scores according to pre-programmed instructions. The usual options available are the following: supplying on-screen or printed test results to test takers, providing test takers with an overall evaluation, accumulating data to update test norms, and saving data for research purposes. In using the second procedure, Item Response Theory is adopted to create adaptive testing. In this case, test takers may respond, not to all test items, but to a minimum number of individually determined items that best predict the final test scores. The number and nature of the items to be included in the test are either computer-determined or self-determined. In this procedure, the computer has the obvious advantage of mathematically estimating (according to a preset algorithm) optimal item collection to provide the most valid test scores.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

Internet-based psychological profiling is a recent extension of Computer Based Testing (CBT), a technology developed in the 1980s. The new procedure possesses the benefits and costs of computerized profiling and introduces several new fascinating professional opportunities. Side by side with professional profiles, numerous, mostly immoderate, popular, quasi-psychological profiles have been published on the Internet in different diagnostic areas such as intelligence and special aptitudes, personality traits, emotional states, interpersonal and social behaviour dispositions, career interests and guidance, and more. This chapter reviews representative Internet-based psychological profiles and discusses their professional status. The purposes of this chapter are as follows; (a) to share and discuss psychological profiling procedures on the Internet; (b) to discuss examples of Internet-based psychological profiles; (c) to review the current available research on Internet-based psychological profiles; (d) to discuss relevant legal and ethical issues; and (e) to propose directions for future research and development on this subject in the chapter summary.

2.2 Internet-Based Psychological Profiling

The formation of the Internet and its exploitation by psychology created an unprecedented opportunity that has enabled the general public to use various psychological tools and services from a remote system. In the context of profiling, the Internet was first exploited to transfer test results quickly and even to deliver complicated psycho diagnostic information for immediate consultation by means of videoconferencing. More sophisticated, efficient use of the Internet for psychological profiling soon followed; a test could be uploaded into a server anywhere on the Internet, and users could take it from a distance in a place and at a time of their choice. Moreover, the development of CGI scripts and Java applets introduced a wide range of profiling possibilities from a distance. Early Internet-based profiling and questionnaires were in a form that included only a list of items and scoring instructions; this procedure then changed to computerized scoring, sometimes accompanied by interpretations and recommendations. Although this procedure best fits a multiple-choice testing format and Likert-type questionnaire items, the use of fast Internet communication made open-ended, even essay format possible, as well.

Internet-based profiling requires a remote access connection and standard Internet-browsing software. In contrast to stand alone or local network-based profiling, Internet-based profiling does not require test software; the software is installed on a remote server that uses a few, rather standard capabilities of a user's personal computer. Access to a particular Internet-based profile may be open to all or limited to selected users by means of a password or other mechanism. Test time can be predetermined, but most Internet-based psychological tests are practically unrestricted in terms of time. For most tests, users are instructed to click their responses on an HTML form and to submit it when done through the click of a 'send' button. Results, in most cases, are provided in seconds. Internet-based psychological profiles include profiles of various types: tests of intelligence and of specific scholastic abilities, perceptual tests, clerical tests, measures of a wide range of attitudes, personality inventories and specific personality traits, career interests and attitudes, and more.

2.3 Examples of Internet-Based Psychological Profiles

Listed below are some representative examples of Internet-based psychological tests to illustrate what is being developed and what is currently available on the Web. These examples are not meant to be an exhaustive list, for there are literally scores from which to choose, and many are quite professional. The examples are intended to be representative, reflecting the variety of types of tests available on the Internet. All of the psychological profiles discussed here are interactive, Web-browser-based tests that give the test-taker immediate feedback on results.

2.3.1 Psychiatry Information for the General Public

Hosted by the New York University Department of Psychiatry (at <http://www.med.nyu.edu/Psych/public.html>) offers screening tests for the public related to depression, anxiety, sexual disorders, attention deficit disorder (ADDC), and personality disorders. The website also includes quality informational references on many psychological disorders and links to relevant reading materials. All of the tests are 10-item inventories of symptoms, with 4- or 5-point Likert scales or checklists. All have a disclaimer on the test page and on the results page as well as links for referrals and more information about the condition being tested. For example, Online Screening for Anxiety (OSA) is a 10-item checklist of anxiety-related symptoms. It has a short disclaimer that states, “OSA is a preliminary screening test for anxiety symptoms that does not replace in any way a formal psychiatric evaluation. It is designed to give a preliminary idea about the presence of mild to moderate anxiety symptoms that indicate the need for an evaluation by a psychiatrist.” It is advised to seek a psychiatric consultation,” and links to referral information and information on anxiety. The format is similar for the other tests.

2.3.2 Queendom.com: Tests, tests, tests

Is a battery of original psychological tests (at <http://www.queendom.com/tests.html>) offered at no charge to the public. This site is geared toward self-help and personal growth. It includes a short description of what each instrument is intended to measure, clear instructions on how to take the test, and the amount of time each require. The site offers inventories on anxiety, social anxiety, self-esteem, communication skills, coping skills, assertiveness, Type A personality, lifestyle, extraversion/introversion, sales personality, IQ, jealousy, relationship satisfaction, depression, emotional IQ, leadership, locus of control, burnout, optimism, relationship attachment, and arguing style. Each test has a different format, whether Likert scales, multiple choice, checklists, or a combination of these techniques. Scoring is immediate, the results giving feedback on the number of responses, percentages, and percentiles. The Optimism test, for example, provides clear instructions on how to answer the questions, what will happen in the case of an omitted response and the amount of time it takes to complete. The test has 18 multiple-choice questions and takes 10-20 minutes to complete. Once submitted, the results are reported immediately, giving the range of scores (0-100) and a short narrative of the results. The “Results” page also presents a link to yet another personality test. The site includes referrals to counsellors and links to further psychological information. Although there are a number of advertising banners on each page, the layout of the site has a crisp, clean appearance, and it is user friendly. Reliability and validity data are available for most scales. Copyright restrictions are clearly stated with exceptions made for non-commercial research for which the researcher registers to use. With the exception of licensing for research, scoring must be done online with the forms supplied by the website.