

# 어느 시스템 분석가로부터의 편지: 해석적인 접근

## Letter from A Systems Analyst: An Interpretative Analysis

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### 요 약

시스템분석가에게 요구되는 기능과 기술이 무엇인지를 밝히는 것은 기업들은 물론이고 경영교육기관들에게 매우 중요한 문제이다. 인터넷과 같은 엄청난 기술의 발전은 정보기술 연구자들로 하여금 어떤 기술이 쇠퇴하고 어떤 기술이 새롭게 등장하는지를 밝히도록 요구하고 있다. 이 논문은 새로이 대기업에 취업을 하여 일하고 있는 시스템분석가로부터 온 편지의 내용과 교육기관에서 사용하고 있는 교재의 내용을 비교 분석하고자 한다. 이것은 정보기술종사자들의 편지가 또 하나의 훌륭한 연구 및 교육자료임을 밝히고자 함이다.

**키워드 :** 시스템분석가, 업무기능, 기술, 편지해석

## I. Introduction

SA (Systems Analyst) has been considered one of the most important paths in IT professional career. Because the demand for timely and efficient information systems development is higher than ever before, the importance of the SA in business organizations is very high. The current job market undoubtedly has a demand for SAs. Occupational Outlook Handbook from the U.S. Department of Labor (2000) reveals that SA is projected to be one of the top 20 occupations in the number of new job openings for the beginning of the new millennium. Business organizations are faced with the critical need to recruit the well-trained SAs with up-to-date and solid skills.

Identifying the skill sets that are needed for SA is very important to business schools as well as business organizations. MIS programs in most business schools should be able to help students develop their own skills and knowledge bases for their future careers. Many efforts (e.g., Arvey and Hoyle, 1974; Grabski et al., 1987; Graf, 1994; Todd, McKeen and Gallupe, 1995) have been undertaken to identify and understand the skills of the SA since the early 1970s. We believe that the tremendous speed of technological advances like the Internet always require academic researchers to periodically review the skills for obsolescence as well as identify new skills needed. In this paper, we attempt to compare the skills that are required for SAs in our textbook with those

skills that are mentioned in a letter of an entry level SA who has just graduated and been working for a large corporation.

## II. Research Method and Question

There are various ways to answer the question, "what skills are needed for today's SAs?" First, we may simply believe what has been said by the professional organizations such as the Association for Information Technology Professionals (AITP), the Association for Computing Machinery (ACM), or the Association for Systems Management (ASM). Second, we could conduct a survey of the SAs who are working in industry. Third, we could look into the job advertisements to review what skills are needed for SAs (Todd et al., 1995).

We chose to investigate a letter from an SA who has recently graduated and started her career as an entry-level SA. The main purpose of this study is to make sure how well the letter reflects what we are teaching in our classroom. To this end, the letter will be analyzed based on the textbook written by Whitten and Bentley (2000: W&B hereafter). Although generalizing one SA's own experience is problematic, we believe that this approach provides academic researchers with another window to looking at the real world. In fact, a few previous studies (e.g., Jarvernpaa and Ives, 1991) analyzed letters for the purpose of conducting IS research. Few efforts, however, have been made by using the interpretive approach. Using the interpretive approach, we attempt to measure the degree to which the contents of textbook reflect the real world.

According to W&B, there are nine group of skills: (1) working knowledge of IT, (2) computer programming experience and expertise, (3) general business knowledge, (4) problem-solving skills, (5) interpersonal communication skills, (6) interpersonal relations skills, (7) flexibility and adaptability, (8) character and ethics, and (9) systems analysis and design. By comparing the letter from entry-level SA with the textbook contents in W&B, this study attempts to answer the question, "Can letters from IT professionals be used to conduct IS research?"

## III. Interpretation

### 3.1 Working Knowledge of IT

(46) To make a long story short, midway through development, the company decided not to build the system from scratch, but to buy a software package and customize it. (52) We also built an electronic data interchange for a company that tracks current market prices for pipe and wellhead.

To show end-users and management how new technologies can benefit their business and its operations, SAs as agents of change must be aware of both exiting and emerging IT and techniques (W&B, p.21). In turn, SAs must have knowledge about up-to-date technologies and techniques with regards to IS development. Even though the letter was written mostly about the inventory project, we can come up with many instances implicating the importance of up-to-date IT knowledge. From sentences 46 to 55, it is easy to imagine that the SA investigated a variety of ways to making the systems work. Knowledge about the up-to-date tech-

nologies would provide the SA with more ideas to solve problems encountered. For example, in designing the electronic data interchange systems, the SA must have searched the up-to-date network solution to optimize speed and cost.

### 3.2 Computer programming experience and expertise

(70) I coded some of the programs myself (in COBOL and PL/I).

(12) Once settled from my first big move, I had to make another major life adjustment--I was expected at work at 7 : 15 a.m.! (13) The first few weeks, I was enrolled in various training classes on the petroleum industry as well as technical classes on COBOL and JCL.

Do MIS students need to learn programming languages? The answers from both W&B and the letter are the same, "Yes." The new SA actually developed some computer programs. Here, we simply can ask a question, "Why did the company give her classes on both programming languages even after they hired those who learned like COBOL and JCL?" The company might have thought that the programming experience in school would not have been enough to do the programming job in a real setting. Since most MIS schools are now teaching visual languages like Visual Basic, Visual C++, or Powerbuilder, it would be another research topic how easily those visual trainees can learn the old style languages like COBOL, Fortran, or PL/I. However, more importantly, the letter tells us that not only she took COBOL and JCL but she also had trainings on the petroleum industry. We might ask from this paragraph is "Why did they teach about petroleum indus-

try?" It is easy to have a gut feeling that the company believes that the industry specific jargons and terminologies should still be taught to their new employees. We can infer the motivation of the two different classes at the beginning of the SA's career from the text of W&B (p.22), "Whether or not SA write programs, they must know how to program because they are the principal link between business users and computer programmers."

### 3.3 General business knowledge

(25) My first job was to understand everything about pipe and wellhead warehouses, including how material is ordered, received into inventory, inspected, tracked, transferred to the drilling sites, etc. (26) Ed and I spent six weeks in a large conference room drawing data flow diagrams of the processes.

In order to be able to communicate with business experts to gain knowledge of problems and needs, it is recommended that SAs take courses such as accounting, finance, marketing, human resources, operations, and manufacturing (W&B, pp.22-23). The letter directly indicated the importance of functional business knowledge. The SA had to work with many different specific business functions like inventory (49), sales and use tax (50), and accounting (53). For instance, understanding everything about pipe and wellhead warehouses (25) has nothing to do with any type of computer skills. Even though the purpose of that understanding was to draw data flow diagrams of the processes, only preliminary knowledge about that specific industry (in this case, petroleum industry) would help the SA understand

the pipe and warehouse.

### 3.4 Problem-solving skills

(41) We always had to communicate with the other sub-systems.(42) For example, the purchase order sub-system wanted to use a new material catalogue, which would affect everyone of our programs.

W&B address that the SA must be able to break down a problem into its component parts, analyze the various aspects of the problem, and then assemble an improved system to solve the problem (p.23). Even though the main problem was about inventory control, its component parts were many other sub-systems as the letter says (41-42). To solve the problem, the SA must have understood how the problem is related to other sub-systems.

### 3.5 Interpersonal communication skills

(63) I also had to give lots of presentations to other project teams, supervisors, and users. (64) At first I was so nervous about these public speeches. (65) But I joined Toastmasters and learned to really enjoy talking in public. (66) That was a vital skill to learn because that's about the only time senior level people are exposed to the analysts, and they are the ones who ultimately determine performance ratings.

(72) I did some technical writing by documenting new systems, including technical documentation and user documentation. (73) The best things I loved about these two years was making friends with all the other analysts (work was very social), learning all the time about both the business and technology, meeting new challenges such a public speaking and learning to adjust my "technical jargon" to my audience.

W&B emphasize the importance of the ability of the SA to speak and write for the better communication. The letter has clearly shown how important both oral and writing communication skills were to the SA (63-66; 72-73). In another specific example (26), the quality of data flow diagrams must have been dependent upon the communication ability of the SA who had listened to and talked to the full-time user, Ed.

### 3.6 Interpersonal relations skills

(67) In summary, my first two years as a systems analyst were very exciting.(68) I spent most of my time talking with users to understand the business and to other analysts to ensure compatibility between subsystems.

W&B point out several reasons that the interpersonal relations skills are important to the SA: (1) working effectively with people; (2) mediating conflicts between individuals and goals; and (3) playing a role as a change agent. By reading through the letter, we can make sure how important these reasons mentioned by W&B are. The SA mentions that she spent most of her time talking with users and other analysts (68). The relations ranged from users to other analysts and developers.

### 3.7 Flexibility and adaptability

Because no two systems development projects are identical, successful SAs need to be flexible and adaptable to unique challenges or situations presented by every project (W&B, p. 24). The letter tells us that there were unex-

pected challenges such as the resignation of the project leader (27) and wearing suits and shoes unsuitable for the environment (31-32), and so forth. The SA needs to have a great deal of adaptability. For example, both moving to Houston and waking up early morning were definitely a challenge to the new SA who just got out of college.

(27) Then the project leader quit and there was no immediate replacement (Boy did I panic). (31) This experience was a shock. (32) I showed up at the warehouse in a suit and heels, expecting a clean building with conveyor belts and fork lifts. (33) Instead it was a huge dirt lot with a fence around it.

### 3.8 Character and ethics

(60) I was also the security request coordinator. (61) Everytime someone wanted access to a data set, I had to verify that they have a legitimate need to either read or read/write to a dataset.

Regarding systems development projects, there are many ethical issues such as information security and software copyrights (W&B, p.24). To play a role as the security request coordinator, the SA had to verify that someone asking the access to a dataset has the right to do that.

### 3.9 Systems analysis and design

(69) I did a lot of design work, and created documentation for these designs, including reports, input forms, and programming specifications.

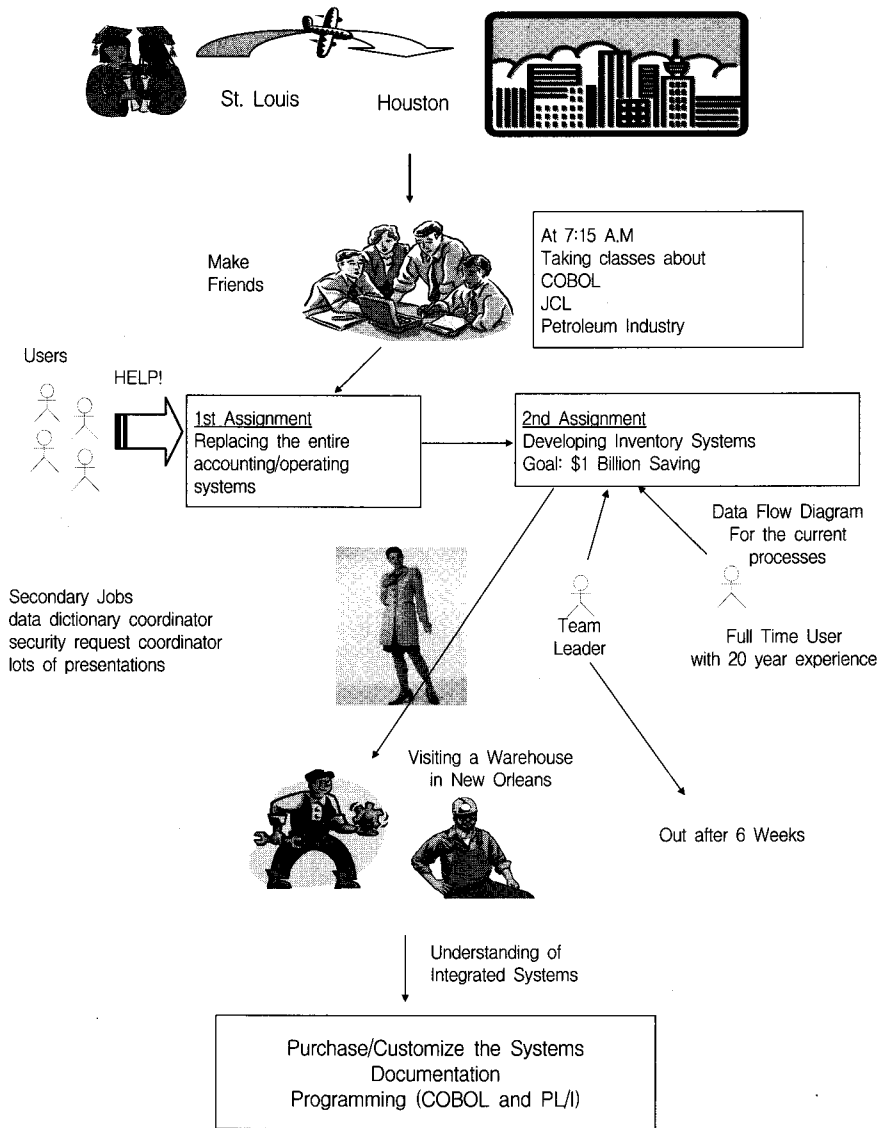
W&B (p.25) address that not only concepts

and principles but also tools and their associated techniques are used to analyze and design information systems. The SA's letter mentions that data flow diagram and programming languages like COBOL and PL/I have been used. Specific concepts and principles for systems analysis and design do not seem to appear in the letter. However, the fact that the SA did documentation work implies that there were concepts and principles.

## IV. Rich Picture Diagrams

To understand the experience of the SA, we need to climb the mountain of sentences and see the whole picture from the top of the world. As one of the ways that allow us to stand on the top of a situation, rich picture is "the expression of a problem situation compiled by an investigator, often by examining elements of structure, elements of process, and the situation climate (Checkland, 1999, p. 317)". By drawing the rich picture that has been applied to systems approach, we will be able to stand on the better spot that allows us to see the SA's experience from the top. In fact, rich picture diagrams have been used to express many situations such as bridge construction project (Stewart and Fortune, 1995), Hillsborough disaster (Lea, Uttley, and Vasconcelos, 1998), and human resource management (Bolton and Gold, 1994).

Because there were very complex interactions among actors, issues, and values, decomposing the sentences based upon the text-book may lead us to lose the whole picture. In other words, looking at each of the specific skills does not lead us to understand what has



<Figure 1> Rich Picture of SA's Experience

really happened throughout the SA's whole experience. <Figure 1> illustrates the SA's experience from the beginning to the present.

## V. Discussion and Conclusions

We have shown that the contents in the letter implicitly or explicitly cover all the nine groups

of skills that are required for today's SAs. There might be more skills that could be found from the letter even though we believe that W&B textbook covers most skills in the letter. There are several research questions and issues regarding letters from IT professionals.

First, how we can read between the lines in the letter will be another methodological topic.

The number of cases (letters) that can be collected by researchers might be too small to be statistically analyzed, and each interpreter might come up with different meanings from the same letter. However, by making the research source like letter available to the research community using the Internet, we can allow other researchers and practitioners not only to reduce the risk of the researcher's bias and preferable translation but also to interpret the source from their point of view.

Second, letters from IT professionals need to be regarded as a good research source. The letter will be able to be used as another window to looking at the up-to-date skill requirements for the SA. Using interpretative analysis as illustrated in this paper, researcher may be able to identify the skills that are mentioned in the letter. The letter can also be used as a tool to make sure that the findings from other research methods like survey are consistent with the contents of the letter. In addition, the findings from the analysis of the letter can be ultimately used to identify how different an industry is from another industry. By comparing letters from IT departments in petroleum industry with letters from retail industry, we can foretell how each industry is using the information technology on their own.

Third, considering letters as a good teaching material, we can pose a question, "Can students identify what kinds of skills are needed for the SA from reading this letter?" If the skills identified by students who read the letter are similar to those skills mentioned by W&B or found by academic researchers, then letters from IT professionals will be a very good source for teaching students in our classroom. By reading

these letters, students will be able to prepare themselves for their future careers.

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## 〈Appendix〉 A Letter from A Systems' Analyst

Available at <http://www.umsl.edu/divisions/business/mis/system.htm> as of May 31st. 2004.

(1) I received a job offer from a large petroleum company during my senior year in college. (2) Upon hearing the news of the offer, my mother said, "That's wonderful darling, but what's a systems analyst?" (3) At the time, I really didn't know! Three weeks after I graduated in May, a big moving van collected all of my possessions, including my new car (my first post-graduation debt!). (5) I flew on a plane to Houston while the van made its way south. (6) I did not know anybody in that city. (7) My only contact was an employee that had called me a few times. (8) I knew his name was Fred and I thought he was another systems analyst. (9) When I arrived in the city, I called Fred and he invited me to meet him at headquarters. (10) To my surprise, Fred had a huge corner office on the 25th floor--he was a big-shot manager, not another systems analyst. (11) Fred introduced me to the people in human resources who helped me find apartment and get situated.

(12) Once settled from my first big move, I had to make another major life adjustment--I was expected at work at 7:15 a.m.! (13) The first few weeks, I was enrolled in various training classes on the petroleum industry as well as technical classes on COBOL and JCL. (14) During this time, I got to make friends with the other 60 new hires. (15) (I said this was a big company). (16) Most of the first work assignments for the new hires were support of existing systems. (17) My first assignment was on a development team to replace the entire accounting and operating system for the company. (18) There were 70 people on the project, divided into various sub-groups based on business functions, such as accounts receivable, inventory control, accounts payable, general ledger, chart-of-accounts, etc.

(19) I worked on the inventory control subsystem. (20) My team consisted of a team leader--another analyst with 5 years experience, myself, and a full-time user, Ed. (21) Ed used to run one of our largest pipe and wellhead warehouse in New Orleans, but was re-located to Houston to work on this project. (22) He had over 20 years with the company. (23) The goal of our subsystem was to reduce the \$1 billion in surplus inventory due to poor business processes. (24) There were over 2,000 warehouses (some are very small, basically a pile of pipe next to a drilling site) and 300,000 material codes. (25) My first job was to understand everything about pipe and wellhead warehouses, including how material is ordered, received into inventory, inspected, tracked, transferred to the drilling sites, etc. (26) Ed and I spent six weeks in a large conference room drawing data flow diagrams of the processes. (27) Then the project leader quit and there was no immediate replacement. (Boy did I panic). (28) I decided that I had to go to the warehouses because I couldn't conceptualize the business from the data flow diagrams. (29) (Plus I was excited about going to New Orleans).

(30) My senior supervisor said I could go to Midland/Odessa (this was less expensive than New Orleans). (31) This experience was a shock. (32) I showed up at the warehouse in a suit and heels, expecting a clean building with conveyor belts and fork lifts. (33) Instead it was a huge dirt lot with a fence around it. (34) I followed the warehouse personnel and began to appreciate why the account-

ing systems were so messed up. (35) These people were so busy hauling and inspecting pipe (with big water-pressured machines), that the paperwork was the last thing they did each day. (36) They had to fill out forms and have to remember the material codes for everything that went in and out of the warehouse that day. (37) With 300,000 material codes to choose from, that's no easy task. (38) If they don't know the material code, they have to write out a detailed description, such as the weight, grade, thread, length, condition code, etc. (39) After that trip, Ed and I had a much better time communicating.

(40) After starting to design the inventory control system with Ed, I learned the true meaning of the word "integrated system". (41) We always had to communicate with the other sub-systems. (42) For example, the purchase order sub-system wanted to use a new material catalogue, which would affect every one of our programs. (43) The chart-of-accounts sub-system wanted to create new accounting codes, again effecting the design of every one of our programs. (44) We all had to keep in constant communication and there were squabbles as to who would change what. (45) (I.E., everyone wants the other team to accommodate them.)

(46) To make a long story short, midway through development, the company decided not to build the system from scratch, but to buy a software package and customize it. (47) We waited 4 months for the contract to be negotiated and signed. (48) With the prospects of nothing to do until the new system arrived, our senior supervisor created "RAMBO" teams to design, develop, and implement little fixes to our current system. (49) The inventory control team (which had a new project leader, yeah!) began designing lot's of little things to fix. (50) We bought a Sales and Use Tax table and wrote a program to automatically calculate the right tax for material transfers. (51) (The tax laws are so complicated that we were paying taxes "just-in-case".) (52) We also built an electronic data interchange to a company that tracks current market prices for pipe and wellhead. (53) This was great because the accountants used to have to keep tons of catalogues in their office to look up prices. (54) We wrote another system to immediately put joint interest checks in a bank (an electronic funds transfer). (55) (Actually these projects took more than 4 months, but you get the idea).

(56) While working on the development team, I also had other duties. (57) I was the data dictionary coordinator. (58) That meant that as project teams started identifying new data items, I had to give them a valid name and enter it into the dictionary. (59) I also provided reports for the database design team who had to logically order all these data fields.

(60) I was also the security request coordinator. (61) Every time someone wanted access to a data set, I had to verify that they have a legitimate need to either read or read/write to a dataset. (62) I passed the paperwork to the Security Administrator.

(63) I also had to give lots of presentations to other project teams, supervisors, and users. (64) At first I was so nervous about these public speeches. (65) But I joined Toastmasters and learned to really enjoy talking in public. (66) That was a vital skill to learn because that's about the only time senior level people are exposed to the analysts, and they are the ones who ultimately determine performance ratings.

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## Letter from A Systems Analyst: An Interpretative Analysis

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### Abstract

Identifying the skill sets that are needed for SA is very important to business schools as well as business organizations. The tremendous speed of technological advances like the Internet always require academic researchers to periodically review the skills for obsolescence as well as identify new skills needed. In this paper, we attempt to compare the skills that are required for SAs in our textbook with those skills that are mentioned in a letter of an entry level SA who has just graduated and been working for a large corporation.

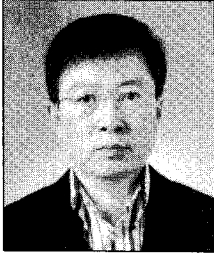
***Keywords: Systems Analyst, Job Function, Skill, Letter Interpretation***

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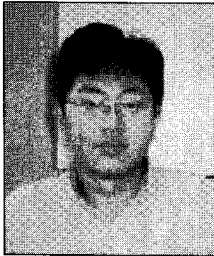
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## ◎ 저자 소개 ◎



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서강대학교에서 물리학(이학사), 경영학(경영학사)을 복수 전공하였으며, 미국 University of Nebraska-Lincoln에서 MIS전공으로 박사학위를 취득하였다. 현재 계명대학교 경영정보학과 교수로 재직 중이며, 현직에 오기전에는 미국 Bowling Green State University에서 조교수로 재직하였다. 한국경영정보학회 부회장, 한국정보시스템학회 회장을 역임하였으며, 현재 대구경북 CIO협의회 회장, 대구경북 ECRC전문위원, 대한상사중재원 중재인으로 활동하고 있다. 주 관심분야는 IS/IT의 전략적 활용, 경영혁신, 지식경영, 인터넷창업등이다.



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2003년 8월부터 남조지아 대학의 조교수로 일해오고 있다. 한국항공우주연구소의 시스템분석가로 일한경험도 갖고 있는 이 박사는 네브라스카 주립대학에서 박사학위를 받았다. 계명대학교에서 경영정보학을 전공했고, 남동부 미주리주립 대학에서 MBA를 받았다. 이 박사는 정보기술 직능기술과 그 전략적 활용이라는 주제로 연구활동을 전개하고 있다.

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