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The Identification of Information Technology Competencies Level among Accounting Practitioners

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Information Technology Competencies for Accounting Practitioners: A TOPC Framework

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Abstract

Information technology skills and competencies for accounting practitioners have become crucial for the accounting process in the current business environment. In response to this challenge, the identification of a new and comprehensive set of information technology competencies combined with information technology skills and other skills (namely, professional skills or soft skills) is necessary. This study used quantitative methods to identify the ranking and correlation of information technology competency dimensions among accounting practitioners in Malaysia. The findings indicated that three technical skills, namely, spreadsheet software, accounting packages and advanced word processing, were higher ranked among the technical skills while prioritisation skills, negotiation skills and decision-making skills were top ranked for organisational skills, people skills and conceptual skills, respectively. Additionally, the Pearson correlation coefficient was used to test the relationship between skill dimensions. In this case, all the tested relationships were significant and positive. The results provided insights into how accounting practitioners adopt the skills required for the service and tasks that they are expected to fulfil in practice.

Keywords: Information technology, skills, competencies, accounting practitioners, framework

INTRODUCTION

Assessing the information technology (IT) knowledge and skills of accounting practitioners has become crucial for the accounting process in the current business environment. These IT skills and competencies, however, do not just relate to operating IT tools; it is equally important for accounting practitioners to have complementary organisational, conceptual and people skills. In addressing the issue, The International Federation of Accountants (IFAC), International Education Guideline (IEG) stated that the goal of accounting education and experience is to produce competent professional accountants. In the International Education Statement 3, the IFAC defined competence as "being able to perform a work role to defined standards with reference to real working environments". Hence, competence is identified as a set of IT-related knowledge and experiences that a knowledge worker possesses (Basselier, Reich and Benbasat 2003). These competencies are imperative to enable accounting practitioners to perform their tasks (Wessel 2008). On one hand, these competencies aid the execution of the routine business activities related to accountants' work. On the other hand, they help accounting organisations to create an environment where these technologies operate at their optimum level, thus contributing to the strategic internal and external advantage of the business.

In Malaysia, the Malaysian Institute of Accountants (MIA) and Malaysian higher academic institutions are expressing growing concern about how accounting education prepares students for the profession, as stated clearly by Palmer et al. (2004). Several studies have been undertaken to explore the crucial professional skills (including IT) of accounting practitioners in order to promote public trust and the profession itself. However, most of the previous studies have focused on skills using software and hardware rather than referring to the combination of IT skills and professional skills. For example, the study by Ismail and Abidin (2009) found a relatively low level use of technology by participants, especially in advanced technologies such as Electronic Data Interchange, agent technologies, database design and application service provider, even though these technologies were considered important (2009). These findings were also supported by Mgaya and Kitindi (2008) who argued that technology or software were becoming more sophisticated and complicated, thus,

accountants were facing new challenges and risks. In addition, a study by Lai and Nawawi (2010) revealed that the usage of e-tax applications was still not widespread in tax practice among accounting practitioners.

Most of the findings reported in the literature indicate that only a few technologies such as word-processing skills, electronic spreadsheets, email, electronic search and retrieval and small accounting software packages were found to be adequate in studies that attempted to identify critical IT skills (Greenstein and Porch 2004; Mgaya and Kitindi 2008; Ismail and Abidin 2009). It appears that current IT skills are not sufficient to allow accountants to benefit from the whole range of available IT hardware and software tools. Thus, the identification of a new, comprehensive set of IT competencies, together with a combination of IT skills and other skills (professional skills or soft skills), is necessary in order to produce accountants who are able to maximise IT utilisation in accounting and business processes.

The objective of the present study was to identify the ranking of IT skills and competencies acquired by accounting practitioners and to examine the relationships between four skill dimensions, namely, technical, organisational, people, and conceptual skill dimensions. The literature suggests four different set of skills that are required for a knowledge worker in the contemporary business paradigm to possess relevant credentials; technical skills, organisational skills, people skills, and conceptual skills (TOPC). The TOPC framework is further discussed in the literature review section.

This paper is structured as follows: the next section provides a brief review of IT, the changing roles of accountants, and the IT skills and competencies required by accounting practitioners based on the relevant literature. The second section is the main focal point of the paper and presents the findings of this study. Finally, the paper reports the conclusions drawn in this study.

LITERATURE REVIEW

Increasing levels of global market competition have created new demands and generated challenges for accounting professionals (Carey 2008, Takiah Mohd, Syed Mohd and Selamat 2002). As a result, accounting professionals have been subjected to considerable pressure (Aggrawan 2010) and the role of accounting has changed in recent years; this will continue to occur (Jones and Abraham 2007; Blewitt 2003; Burns and Scapens 2000). Accountants' skills have also changed in order to respond to the expansion of accountants' tasks (Jones and Abraham 2007; Blewitt 2003; Holtzman 2004; Jackson and Lapsley 2003; Yasin, Bayes and Czuchry 2005; Karr 2005; Cardoso et al. 2010) and certainly, accountants all need to improve their skills and knowledge to succeed and grow in the dynamic business environment (Jackson and Durkee 2008; Mohamad and Lashine 2003). Consequently, the current skill set required by accountants needs to be revised in order to deal with the high and increasingly competitive business environment.

As a developing country, Malaysia has also experienced a changing business environment which continues to evolve (Tuan-Mat 2010). IT has developed rapidly in the nation's business environment; therefore, Malaysian accountants have been facing challenges in providing meaningful information to clients and organisations, which involves the integration of technology in the accounting process (Zainol and Nelson 2011; Ismail and Abidin 2009; Lai and Nawawi 2010). One of the challenges is to offer support in the business decision-making processes. This role requires a high level of involvement with other parties such as managers and clients. Therefore, a strong combination of skills (e.g., technical skills, organisational skills, people skills, conceptual skills and other skills) is required. Investigations into the changing roles of accountants have been widespread in many countries such as Australia, the United Kingdom, the United States and Germany (Dillon and Kruck 2004; Grenstein-Prosch and McKee 2004; Mohamad and Lashine 2003; Jones and Abraham 2007; Hancock et al. 2009) and in developing countries (Chang and Hwang 2003; Mgaya and Kitindi 2008; Ismail and Abidin 2009; Lai and Nawawi 2010). In the studies reported in the literature, IT elements appear to be crucial in triggering changes in accountants' roles. For example, according to Mohamed and Lashine (2003):

> Technology has become an inevitable part of today's accounting practice, and therefore selecting equipment and tools, applying technology to certain tasks, and maintaining and tracing and correcting faults in technological devices are necessary skills for the average accountant.

The advance of technology has also significantly influenced the process of decision-making and information systems through the increasing use of accounting software and the Internet. Furthermore, there have been changes in the skills required to cope with the demands of a variety of clients who employ diverse types of business and information system applications. The advancement of technology extends accountants' roles from merely information provision to information facilitation (Jones and Abraham 2007). The effects of information technology on accounting processes have greatly affected accountants' careers since information technology has altered the way accounting services are processed and conducted in organisations (Granlund 2007). Some of the

effects also include organisations' hiring policies and training policies and even the formal curriculum in higher academic institutions (Jordan 1999).

Information is now extensively dispersed within organisations and has become an important element of organisations' success (Mohamad and Ismail 2010). Real-time systems remove the uncertainty of information by providing accurate financial data and information. Accountants have the ability to eliminate unnecessary tasks in their accounting processes and increase their organisations' efficiency through centralised accounting operations and faster financial reporting. The evolution of accounting tasks began with changes in the way information is processed, stored and communicated; however, information technology itself cannot produce meaningful and relevant information without the presence of information technology skills and competencies. IT advances such as electronic resource planning (ERP), database systems, online applications and business accounting software have had a significant impact on the financial environment (Jordan 1999; Chang 2002; Sürmen and Daştan 2007), and forced accountants to revise their skills in order to cope with the technological environment (Jones and Abraham 2007;Chang and Hwang 2003; Bierstaker et al. 2001). Jordan (1999, p. 341) described the implications of IT trends for accountants' roles as follows:

> It is clear that technology has drastically changed the accounting profession….for example, information can be provided in a timely and more accurate manner, but at the price of confidentiality. Some of the impacts of technology are neither positive nor negative; they are simply changes. So in essence, the impacts of technology on accounting have been positive, negative, and neutral, but each impact results in a demand on the profession to conform to the changes.

Due to technology, the accounting task that previously would have been performed by a group of people can be accomplished by one individual. This has challenged accountants to refine their roles and take other opportunities such as joining the management team. This requires accountants to possess other skills, such as leadership skills and project management and communication skills, in order to analyse organisational processes and functions related to decision-making and risk management.

Overall, a complex set of competencies is required by accountants in order to offer better quality services to customers (Jackling and Lange 2009; Awayiga, Onumah and Tsamenyi 2010). Knowledge and experience in IT are at the core of these skills. However, there are certain organisations which prefer their accountants to possess professional skills such as people, organisational and conceptual skills in order to make appropriate use of IT skills in organisational settings. For example, for an accountant, skills and competencies in the use of spreadsheets, taxation software or accounting software are required. However, these software packages are process-dependent and take input from various other areas of the organisation, and at the same time provide output to additional areas of the organisation. In these circumstances, an individual needs to have complementary teamwork, interpersonal, and analytical skills in order to understand the information requirements of the process, to comprehend process hand-offs and interfaces, and to process the information to produce a useful output.

The literature highlights that, over the past decade, the skills and competencies requirements for accountants have been widely discussed (Kavanagh and Drennan 2008). Mohamed and Lashine (2003) concluded that a dynamic business environment has encouraged accountants to improve their skills and competencies. This can be achieved by increasing the capacity related to accounting training and education. Prior studies have indicated that, although IT skills are crucial for performing an accounting task, accountants must develop more than IT skills in order to succeed (Awayiga, Onumah and Tsamenyi 2010; De-Lange, Kacling and Gut 2006). This proposition was supported by Jackling and De-Lange (2009) who stated that accountants need to place greater emphasis on professional skills in order to prepare for employment in accounting.

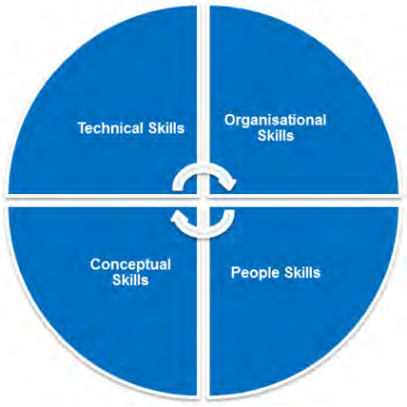

Figure 1: TOPC Framework

Accountants' IT skills and competencies are required to react quickly and effectively in organisations. Thus, the TOPC framework (see Figure 1) consisting of the right mix of the above-mentioned skills was purposely developed to this thesis to prepare accountants to be effective and efficient knowledge workers. The TOPC framework supports accountants in performing tasks/jobs in relation to accounting processes such as auditing clients' financial reports, recording daily financial transactions, preparing financial statements and making decisions. For that reason, the AICPA asserts the values of professional accountants by identifying key TOPC framework elements such as communication skills, leadership skills, teamwork skills and critical thinking skills, as well as project management as cited by Institute of Management Accountants (Dillon and Kruck 2004). A good TOPC framework is critical to the wealth, and even the organisation's sustainability (Aldag and Kuzuhara 2002). Table 1 presents a summary of these competencies based on the literature review.

Table 1: Skills required by accountants

Skill Dimensions	Elements
Technical Skills	Advanced word processing and desktop publishing, spreadsheet, presentation software, operating systems, data communication, information search and retrieval techniques, taxation software, database operations, record life-cycle management, information quality management, data analyses, reporting, querying and business intelligence, information system development, e-commerce applications, accounting packages, data auditing, financial audit automation tools, network configuration and management, IT security, project management software and techniques, workflow automation and business process re-engineering, enterprise resource planning systems, IT governance
Organisational Skills	Time management, project management, business process re-engineering, change management, resource management, prioritisation, planning, organising/designing, and controlling
People Skills	Delegation, leadership, teamwork and collaboration, communication and negotiation
Conceptual Skills	Problem-solving, creative thinking, critical thinking, decision-making and crystallised cognitive ability

Awayiga, Onumah and Tsamenyi (2010) carried out research to identify the knowledge and skills of accounting graduates in Ghana. The study showed that analytical/critical thinking skills were rated as the most important skills for accountants. These results were consistent with the study by Kavanagh and Drennan (2008) which showed that employers expected entry-level accounting graduates to possess analytical and problem-solving skills. On the other hand, Jackling and De-Lange (2009) revealed evidence suggesting that teamwork skills were an important professional skill sought by the accounting profession. The authors also identified other skills such as leadership, communication and interpersonal skills as being elements that can be used to enhance the accountants' credibility.

According to one study, there was a widespread belief among employers and accounting practitioners that entry-level accountants were lacking in practical experience, had little understanding of how the real world worked, and possessed poor communication and inadequate IT skills (Eide 2000). Some researchers have argued that university academics should be committed to developing the appropriate skills for the professional practice of accounting in the future (IFAC 2003; Kermis and Kermis 2011). This statement corresponds with the view of

Memiyanty, Rozainun and Shith-Putera (2010) who recommended that employers should collaborate with academics in order to provide competent professional accountants.

RESEARCH METHODS

This study was conducted among accounting practitioners in Malaysian accounting organisations/firms located in the Peninsular of Malaysia. In this study, quantitative data were collected from primary sources. A total of 130 questionnaires were administrated, and 67 valid responses were received (52% return rate). The main objective of this study was to identify the IT competence of accounting practitioners in performing their tasks. This study used IBM SPSS Statistics version 20.0 (for Windows). This statistical software provides a wide variety of statistical methods for analysing data. The measurement items for the IT skills and competencies construct were taken from the literature (as listed in Table 1). The internal consistency for each construct was identified based on the Cronbach alpha. This statistical approach measured the degree to which the instrument items were homogeneous and reflected the same underlying constructs (Zikmund 2003) and used formulae to measure the internal consistency of the survey instrument (Smith 2011). The higher the coefficients, the better the measuring instrument. Generally, an alpha coefficient measure above 0.7 is considered to be highly reliable.

At the bivariate level, bivariate statistical techniques were used to investigate the study variables. Pearson's correlation coefficient is a parametric test used to measure the strength of any relationship between variables (Cooper & Schindler 2006). The goal of this correlation coefficient is to assess the construct validity of the correlation between the latent variables (Neuman 2005). According to Leedy and Ormrod (2005), "We can measure something accurately only when we can also measure it consistently. Yet, measuring something consistently doesn't mean measuring it accurately. In other words, reliability is a necessary but insufficient condition for validity" (p. 29). Thus, the significance level calculated for each correlation can be a primary source of information about the construct validity of the correlation. In interpreting the Pearson's correlation coefficient in this study, guidelines from Cohen (1988) were adopted whereby a minimum of $r = 0.50$ was considered to show the strength of the correlation.

FINDINGS AND DISCUSSION

Ranking of IT competencies by accounting organisations

The competence skills were categorised into five levels which determined the level of competence acquired by accounting practitioners. The skills with the overall mean score are presented in Table 2. Table 3 shows the mean score, rank and standard deviation of each skill (within the TOPC dimensions).

Table 2: Competence level categorisation

Scale	Competence level
Mean score of ≥ 5	OPTIMISED
between 4 to 4.99	MANAGED
between 3 to 3.99	DEFINED
between 2 to 2.99	EMERGING
between 1 to 1.99	INITIAL

Table 3: Overall mean score of IT competencies by accounting organisations

Variables	Technical Skills		Variables	Organisational Skills		Variables	People Skills		Variables	Conceptual Skills	
	Mean	SD		Mean	SD		Mean	SD		Mean	SD
Spreadsheet software	4.30 (M)	.566	Prioritisation skills	3.72 (D)	.613	Negotiation skills	3.41 (D)	.771	Decision-making skills	3.04 (D)	.694
Accounting packages	4.07 (M)	.736	Organising/designing skills	3.52 (D)	.624	Communication skills	3.22 (D)	.564	Problem-solving skills	3.00 (D)	.424
Advanced word processing and Desktop publishing	4.07 (M)	.574	Planning skills	3.29 (D)	.542	Teamwork and collaboration skills	3.20 (D)	.635	Creative thinking skills	2.90 (E)	.455
Data communication/sharing	3.91 (D)	.715	Project management skills	3.28 (D)	.505	Delegation skills	3.14 (D)	.614	Critical thinking skills	2.78 (E)	.599
Presentation software	3.68 (D)	.637	Time management skills	3.17 (D)	.361	Leadership skills	3.01 (D)	.619	Crystallised cognitive ability skills	2.62 (E)	.718
Taxation software	3.50 (D)	.721	Resource management skills	3.16 (D)	.623						
Financial audit automation tools	3.32 (D)	.716	Controlling skills	3.09 (D)	.460						
Database operations	3.22 (D)	.685	Change management skills	2.65 (E)	.673						
Operating systems	3.17 (D)	.619	Business process re-engineering skills	2.04 (E)	.882						
Data auditing	3.13 (D)	.680									
Information search and retrieval techniques	3.08 (D)	.627									
Project management software and techniques	2.93 (E)	.943									
Information quality management	2.92 (E)	.560									
Data analyses, reporting, querying, and business intelligence	2.91 (E)	.819									
E-commerce applications	2.86 (E)	.667									
Information system development/procurement life-cycle	2.82 (E)	.875									
Workflow automation and business process reengineering	2.64 (E)	.743									
It governance	2.62 (E)	1.019									
It security	2.58 (E)	.698									
Network configuration and management	2.45 (E)	.661									
Record life-cycle management	2.33 (E)	.619									
Enterprise resource planning system	2.29 (E)	.780									

The findings showed that only three technical skills, namely, spreadsheet software, accounting packages and advanced word processing, had mean rankings greater or equal to 4.00, which placed these skills at the MANAGED level of competence. For organisational, people and conceptual skills, the DEFINED level was the highest level of competency recorded by the respondents. For example, the top-ranked organisational skills were prioritisation skills (3.72) and organising skills (3.52), while negotiation skills (3.14) and communication skills (3.03) were the top-ranked people skills, and decision-making skills (3.04) and problem-solving skills (3.00) were the top-ranked conceptual skills.

Nineteen skills recorded scores of less than 3.00 which indicated the EMERGING level of competence. In the technical skill dimension, the means scores ranged between 2.29 and 2.93 including network configuration and management, record life-cycle and ERP which were among the lowest ranked in that dimension. The lowest ranked skills were related to the organisational, people and conceptual skill dimensions. For example, change management and business process re-engineering skills (in the organisational skill dimension) recorded scores of 2.65 and 2.04, respectively. Leadership skills (people skill dimension) scored 3.01 and crystallised cognitive ability skills (conceptual skill dimension) recorded a score of only 2.62.

Correlational analysis for skill dimensions of IT competencies in accounting organisations

Table 4 presents the results of the first correlation analysis for accounting organisations, in which the technical skills were tested with the organisational skills. It showed a strong positive correlation between the technical and organisational skill dimensions (r = 0.56).

Table 4: Pearson's correlation coefficient (r) between skill dimensions for accounting organisations

Dimension	Technical Skills (r)	Organisational Skills (r)	People Skills (r)	Conceptual Skills (r)
Technical skills	1	0.56**	0.56**	0.58**
Organisational skills	0.56**	1	0.54**	0.55**
People skills	0.56**	0.54**	1	0.72**
Conceptual skills	0.58**	0.55**	0.72**	1

**. Correlation is significant at the 0.01 level (2 tailed)

The relationship between technical skills and people skills and conceptual skills were also investigated using the Pearson correlation. A strong correlation was indicated between these dimensions with more technical skills associated with a higher level of people skills and conceptual skills. In other words, the existence of a positive association between these dimensions showed that technical skills influenced accounting practitioners' people skills and conceptual skills in dealing with other parties in a changing accounting business environment. The Pearson correlation test also revealed that organisational skills were significantly associated with people skills and conceptual skills. The strength of the relationships is shown in the results presented in Table 5. It is of interest to note that the relationship between the people and conceptual skill dimensions had the strongest association among the skill sets, with r = 0.75.

The correlation between IT competency dimensions is illustrated in the scatter plots in Figure 2. The points were reasonably closely scattered around an underlying positive line (although the points were widely spread out) for the six types of relationships. The scatter plots indicated that there was a strong positive linear relationship between technical skills and organisational skills, people skills, and conceptual skills (refer to (a), (b), (c)), a relationship between organisational skills and people skills and conceptual skills (refer to (d) and (e)) as well as a relationship between people skills and conceptual skills (refer to (f)). The scatter plots implied that the technical skills score increased with organisational skills, people skills and conceptual skills. A similar pattern occurred in the other sets of relationships mentioned above. This showed a positive linear relationship.

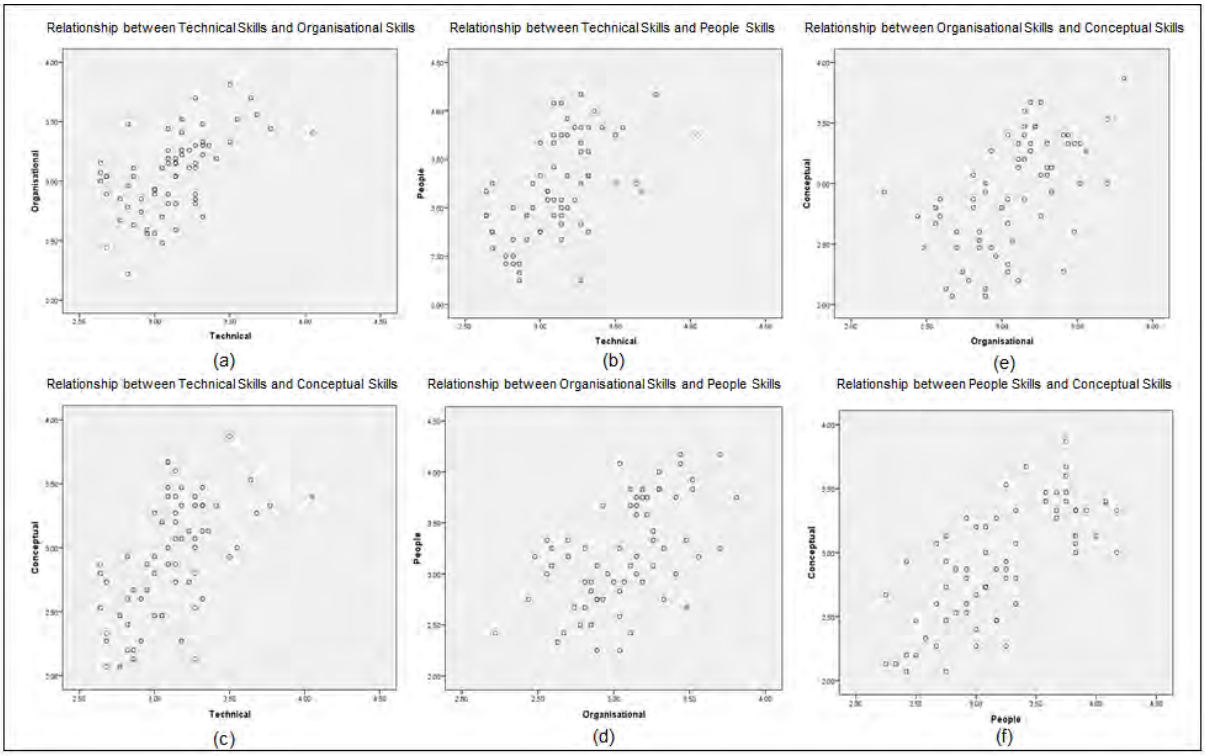

Figure 2: Scatter plots of correlations between IT competency dimensions for accounting organisations

CONCLUSION

This study provided evidence of the importance of IT competencies for accounting practitioners from the perspective of Malaysian accounting organisations. The findings of this study suggest that the levels of practitioners' skills need to be assessed continuously and consistently. Without proper assessment of the skills, accounting organisations would not be able to provide better service and professional work. Additionally, in order to reduce the provision of poor accounting and business-related services to clients and decision-making, the following suggestions should be given serious attention. Firstly, accounting practitioners should understand and recognise the specific issues regarding services to clients and the elements of the relevant IT skills. This behaviour will allow them to coordinate which elements of IT skills and competencies are appropriate to deal with the issues and to ensure the level of services is at a satisfactory level. Secondly, organisations should develop a comprehensive IT competency program for all levels of an accountant's professional life-cycle. Such a program should provide training for managers, partners, senior accountants and junior accountants to enable them to recognise issues in providing and delivering services, to identify root causes and construct possible skills and competencies, and to embed these skills as part of their jobs.

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