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***CHANGES OF DEMAND FOR OCCUPATION IN MALAYSIAN LABOUR
MARKET***

KAMARUL HIDAYAH BT. ABDUL HAMID

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Abstract of the thesis presented to the Senate of University Putra Malaysia in fulfillment of the requirement for the Degree Master of Science

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By

KAMARUL HIDAYAH BT. ABDUL HAMID

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Chair : Rusmawati Said, PhD.
Faculty : Economic and Management

The issue of changes in the demand for occupation came to the forefront and generate much analyses, when rapid industrialisation and globalisation. Malaysian economy has been transformed from agriculture to services economy have resulted in the modification of structural demand for occupations in all sectors. The imbalanced in occupation structure in Malaysia was lead to tighten labour market in 1990s and these issues still unquestionable for policy makers and researchers. This study employed a set of data comprises micro level data from the Household Income Survey (HIS) for several years 2002, 2004 and 2007. This study has classified occupation into four groups namely; fourth, third, second and first skilled level workers. The classification for occupation groups are followed by Malaysia Standard Classification Occupation codes 2008 (MASCO 2008). The study focuses on professional and technical workers.

This study sets out to examine the changes in the composition of occupational that take place and explore the reasons behind these changes for fifteen major sector and details on education sector in the case of Malaysia by using the decomposition approach. The changes in occupation demand are lead by two main factors whether technological change or trade. This study used the terms of within effects that represent the changes in technological change and

between effects represent the changes in trade. In the component of within and between affects this study broken down into wage component and employment component to explain the changes in relative demand. These two hypotheses have been well tested using the Heckscher-Ohlin and Samuelson (HOS) models.

First stage analysis for 15 major industries group shows that professional group had a decreasing trend during the period 2002 to 2007. The main causes of the decreasing are mainly due to changes in wage structure. The changes in wage structure are dominated by technological change or we called in this study as within effects. On the other hand, technical workers had increasing in relative demand during the sample period of study and the main factor that was lead to these changes is employment structure.

At the second stage of analyses, this study focuses on education sector. The education sectors are divided into three sub sector known as primary education, secondary education, and tertiary education sector. Overall, the results show that in all sub sectors, employment structure dominated the changes in relative demand for labour in education sector. Looking at the changes in professional workers, this group shows an increasing trend in relative demand at tertiary education sub sector during the sample period of study. On the contrary, technical workers recorded a decreasing trend in relative demand especially in primary education sub sector.

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PERUBAHAN PERMINTAAN PEKERJAAN DI DALAM PASARAN BURUH MALAYSIA

KAMARUL HIDAYAH BT. ABDUL HAMID

2012

Pengerusi : Rusmawati Said, PhD.
Fakulti : Ekonomi dan Pengurusan

Isu perubahan di dalam permintaan pekerjaan menjadi perhatian dan memerlukan analisis terperinci apabila berlakunya proses industrialisasi dan globalisasi. Perbezaan tahap kemahiran pekerja menyebabkan keadaan ketidakseimbangan pekerja menjadi lebih buruk dan menimbulkan pelbagai persoalan yang sukar dijawab. Peralihan ekonomi Malaysia semenjak 1980an sehingga sekarang memberi impak kepada perubahan struktur permintaan terhadap pekerjaan di dalam semua industri. Tesis ini menggunakan set data mikro iaitu data Penyiasatan Pendapatan Isi Rumah (PPI) untuk beberapa tahun dari tahun 2002-2007. Kajian ini menggunakan empat kelas pekerjaan utama iaitu pekerja tahap kemahiran empat, tiga, dua dan satu. Pengkelasan pekerjaan ini berdasarkan Piawai Pengkelasan Pekerjaan Malaysia 2008 (MASCO 2008). Kajian ini hanya memfokuskan kepada pekerja profesional dan tahap pekerja teknikal.

Kajian ini mengkaji perubahan komposisi permintaan pekerjaan di dalam 15 industri utama dan terperinci di dalam industri pendidikan di Malaysia dengan menggunakan teknik 'decomposition'.

Perubahan permintaan pekerjaan disebabkan oleh dua faktor utama samade perubahan teknologi atau perdagangan. Kajian ini menggunakan istilah kesan di dalam industri untuk menerangkan perubahan di dalam teknologi dan kesan diantara industri untuk menerangkan kesan perdagangan. Di dalam komponen di dalam industri dan di antara industri di pecahkan kepada komponen upah dan komponen pekerjaan untuk menerangkan perubahan relatif permintaan. Dua hipotesis ini di uji menggunakan model Heckscher-Ohlin dan Samuelson (HOS).

Analisis tahap pertama bagi 15 industri utama menerangkan kumpulan pekerja profesional mendapati trend menurun dalam tempoh kajian 2002 hingga 2007. Penyebab utama penurunan adalah disebabkan perubahan di dalam struktur gaji. Perubahan di dalam struktur gaji di dominasi daripada perubahan upah atau di dalam kajian di panggil kesan antara industri. Sementara itu, permintaan relatif yang semakin meningkat bagi pekerja teknikal di dalam tempoh kajian dan faktor utama adalah disebabkan faktor perubahan struktur pekerjaan.

Analisis tahap dua, kajian ini memfokuskan di dalam sektor pendidikan. Sektor pendidikan pula di kelaskan kepada tiga subsektor pendidikan iaitu pendidikan rendah, pendidikan menengah dan pendidikan tinggi. Keseluruhan keputusan menerangkan di dalam kesemua subsektor, struktur pekerjaan adalah paling dominan menyebabkan perubahan di dalam permintaan relatif pekerjaan di dalam sektor pendidikan. Melihat kepada perubahan di dalam kumpulan profesional, kumpulan ini menerangkan trend peningkatan di dalam permintaan relatif di subsektor pendidikan tinggi di sepanjang tempoh kajian. Berbeza, kumpulan pekerja teknikal merekodkan trend menurun di dalam permintaan relatif terutamanya di dalam subsektor pendidikan rendah.

CHAPTER 1

INTRODUCTION

1.1 Introduction

The issue of changes in the demand for occupation came to the forefront and generates much analysis, at the time when differences in wages between skill groups declined in the 1970s and rose sharply in the 1980s, especially in the US (Bound and Johnson, 1992; Katz and Murphy, 1992). As well documented in past literature, Malaysia aims to be developed nation in 2020, In order to achieve her mission Malaysia has transformed from agriculture to knowledge based economy in the era 2000s and more focuses on the services sector. As a result, the structure of Malaysian labour market has been changed and faced imbalanced in the occupations. For instance, the demand for labour in Malaysian labour market is favoured to semiskilled workers and secondary education levels (Said, 2008). The percentage of employees with secondary education level is considered high, approximately 74 percent compared to 24 percent of tertiary education level in 2009 (Malaysia 2010 New Economic Model). Meanwhile in order to achieve developed country, the percentage of skilled workers must exceed than 46 percent. Service workers and shop and market sales workers category preceded the other categories with 1.87 million employed people in 2010. This category also shows an increasing trend by 8.38 percentage point between 2006 and 2010. The number of employed persons in Technicians and associate professional recorded the highest changes by 16.5 percentage point during the period 2006 and 2010 (Malaysia, Labour Force Survey, 2010)

This study identifies the four classes of occupations comprising; fourth, third, second and first skilled workers (Table A1). Empirically, the study focused on the two classes of occupations which are the fourth and third skilled workers in analyzing the changes of occupational structure. Further this study using professional as a fourth skills worker and technical as a third skills worker. More classification of occupations is done according to MASCO 2008 (Malaysia Standard Classification Occupation codes 2008) and the detail discussion is in Chapter 4.

Emerging imbalance labour market has created problems such as polarized occupation structure, unemployment and wage inequality that attracts huge attention. Though numerous changing labour market trends have been identified, such as decline of skilled workers in several industries, researchers are still arguing on the exact factors that lead to these changes. A number of different possible causes of these changes have been identified, including technological progress, knowledge expansion, industrial causes and certain government policies, market or monopoly power and trade or globalization. There is a need to clarify and distinguish the specific reasons for these labour market changes which is important because different determinants implicate different policy positions and solution in addressing the problem of imbalance labour markets.

Transition in Malaysian economic in 1986, from agriculture to industrial began with the Industrial Malaysia Plan I (IMP1, 1986-1995) followed by a rapid development of industrialization in the late 1990s which further brought rapid growth to the Malaysian economy. The progress in information technology and rapid growth of knowledge economy in the US highlights technology as a key factor in increasing productivity and competitiveness, and this phenomenon lead to the stabilization of IMP2 (1996-2005). The importance of globalization and information technology revolution lead Malaysia to displace the economy from industry based to knowledge based economy which forms the basis of the Knowledge Economy Plan in 1996. Changes in the structure of

Malaysia's economy are precursors to the transformation in the occupational structure¹ of workers in Malaysia labour market.

Although the pattern of movement in the Malaysian occupational structure has been documented in a study by Said (2008), this study focuses on sectoral level using aggregate data from manufacturing sector. This study found that changes in the relative demand for labour seem to favour semi-skilled workers and that technological change has been the main reason for the changing employment pattern in Malaysia. Most previous studies focused on underlying factors that shift the relative demand for occupation, where trade and technology are suspected to be the main cause (Manasse, Stanca and Turrini, 2004). Different from previous studies, this study employed a set of micro level data from the Household Income Survey (HIS) for the period of 2002, 2004 and 2007 and the selection of micro data allows detailed observation of each industry. Exact factor can be seen on each critical sector that have to focus on development of Malaysia economic towards developed nation on 2020. In general, this study attempts to address the presence of significant gap in the previous literature on the causes of changes in occupational structure in developing country and specifically looks into the case of Malaysia.

This chapter is structured as follows. The first subsection 1.2, gives an overview of the research background, followed by the problem statement of the study presented in section 1.3. Section 1.4 expounds the main objectives of the study, while Section 1.5 discusses the scope and limitations of the study. The chapter finally wraps up in Section 1.6, which sets up (provide) the organization and structure of the thesis.

¹ Occupational structure in this study refers to the aggregate distribution of occupations in society, classified according to skill level, economic function, or social status. The occupational structure is shaped by various factors such as; the structure of the economy; technology; labour market; and status and prestige of the employment (Gordon, 1998).

1.2 Research Background

The analysis of labour demand suggests that as the Malaysian economy progresses towards knowledge based economy during the period 2002 - 2007, significant effects in the changes of occupational structure have become visible in the labour market. These changes further raises the question as to whether the changes in occupational structure related to a factor specific shocks such as changes in relative productivity or sector specific shock which alters relative market share or average wage rate. This has been adequately documented in previous studies.

From 1981 until 1985, the transition of Malaysia economics to industrial phase is showed some initial effort to implement the transformation of an economy that is based on a few commodities for export from diversified agriculture product and industry. In 1980, the contribution of agriculture to GDP was 22.9 percent compared to 19.6 percent from the manufacturing sector. The period 1986 to 1998 beheld the beginning of the industrial phase with the First Industrial Master Plan (IMP1) drawn in 1986 as the key reference document. It is during this phase that the manufacturing sector recorded a robust growth, particularly in the electric and electronic (E&E) industries. The entrance of several multinational firms from developed countries such as U.S, Japan, Korea and Singapore in the manufacturing sector increased the flow of international trade.

For instant, in the late 1990s, the share of the agriculture to GDP was only 8 percent compared to 33 percent share of the manufacturing sector and 45 percent share of the service sector. However, the mid-1997 financial crisis had imposed significant impacts on the economy though the effects were temporary. During this period, effort has been focused on preparing Malaysia to face the new challenging phenomenon of globalization, trade liberalization and rapid advancement of science and technology (S&T) including IT and biotechnology. Corresponding to these industrial transitions, the

labour structure is supposedly also experienced a change in occupational structure from primarily, low skill occupation to middle skill and ultimately to higher skill (Zou, 2004). In Taiwan, Liu (2001) traced the influence of industrial structure transformation on employment and income distribution from 1991-1996 and found that the labour structure was actually determined by industrial structure transformation. The skilled employment² grew remarkably while those unskilled workers³ dropped considerably.

As a greater part of the plan to develop a knowledge society, the Third Outline Perspective Plan (OPP3) highlights that Malaysia is building up a knowledge-based economy and is working towards establishing a knowledge-based workforce. Consequently, employment growth increases rapidly but may create its own problem as predicted by the International Labour Organization (ILO). Reflecting on the experience of many East Asian countries and some Latin American economies, trade liberalization has increased the demand of skilled workers, which occasionally fell short of supply, despite increasing wage. In Malaysia, for example, between 1986 and 1994, a small function of the rising wage gap between skilled and unskilled workers is attributable to the differentials in demand elasticity. Skilled workers also have smaller supply elasticity than semiskilled and unskilled workers. In China, the pressure from improved competitiveness and the adoption of new technology has increased the demand for skilled or professional workers more than the supply and created an imbalanced labour market. This situation has also arisen in Chile since it underwent trade liberalization in the 1980's, Chile has been concerned with the increase inequality between skilled and unskilled workers due to the scarcity of skilled workers (Said, 2008).

² This study uses classification from MASCO 2008, where class of skilled workers are categorized; professional are classified as fourth skill level workers and technical are classified as third skill level workers

³ Class of unskilled workers are those in first skill level workers (Table A1)

The analysis of the trend changes in demand of workers for each skill levels between Malaysia major industries over the period 2002 until 2007 demonstrates some interesting patterns. Apparently, in chapter 4, this study discuss trend demand of employees by occupational groups in detail and we will see in Malaysia labour market majority of the employees is in the second skilled level worker (semiskilled workers). The second highest number of employees are working in the third skill level (as part of skilled workers as familiar refer to technical workers).

In this study, the focus also directed towards the education sector and the reason being as a developing nation, Malaysia is persistently exposed to global competition, human resource development and at its heart the drive to increase its competitive strength become essentially crucial (Harbinson & Myers 1964; Porter, 1985). Theoretically, as expounded by Becker (1964), the development of human resources is best done through investment in education. Becker's (1964) theory of human capital shows a positive relationship between wages received by labour and education. This theory is supported by another empirical study by Mincer (1974) in the United States, who showed that education is indeed an important factor that determines the level of earnings. One important purpose of education is to provide a larger workforce as required by the market. Human resource development through education aimed at developing the country by providing sufficient supply of quality skilled manpower to generate high productivity. Malaysia's aspiration to achieve a developed nation status by 2020 and the transformation of the country into a knowledge based economy requires a competitive education sector with a high quality and skilled workforce in this sector. However, the education sector in Malaysia is still lack of skilled workers. Later, Chapter 4 will describe in greater details the trend of workers by occupation in the education sector and factors leading to the changes in the demand of employment and the discussion will continue in Chapter 5.

1.3 Problem Statement

Economic transformation towards a knowledge based economy is the driving force for the Malaysia economic activities to promote growth based on information and knowledge. The knowledge economy agenda drawn for Malaysia in 1996 is one of the strategies framed by the government to achieve Vision 2020 aspiration. Changes of the economic structure from 1980s until now have resulted in the modification of structural demand for occupations in all industries and lead to unbalanced Malaysian labour market. After the economic crisis on 1997, Malaysia face strong take-off in 2003 and the new economy grew between 5 and 6 percent in 2005 and 2007. The relatively high economic growth is expected to result in a stronger demand for labour, especially for semiskilled and high skilled workers. At present the economy is facing prevailing skill shortage in some specific sectors while the government is encouraging skilled Malaysian who are working abroad to return home as a short term measure in attempt to fill these shortages. Meanwhile it is estimated that some 55 to 66 thousand graduates are at present unemployed. This can be attributed to the mismatch of their skills with current vacancies.

The problem of skill mismatch labour market is well documented in previous literature review and one of the factors leading to this problem is due to misallocation of labour and the mismatch between demand and supply of labour (Rahmah, 2003). As presented in Table A2, the mismatch phenomenon occurred in Malaysian manufacturing sector based on the number of vacancies, job seekers and the placement rate from the national labour market information data. Job vacancies in professional category for example increase from 5,187 vacancies in 2004 to 26,592 in 2006 and new job seekers also increase from 22,173 seekers in 2004 to 25,529 seekers in 2006 but placement of registrants only 295 placement in 2004 and 1446 in 2006. Similar situation in Technician and Associate Professional categories, total registered vacancies between years 2004 to

2006 is 6,848 vacancies and then increased to 10,139 vacancies in 2006. New job seekers 17,360 peoples in 2004 and increased to 16,481 peoples in 2006 but placement registrants only 516 peoples in 2004 and then 1,136 peoples in 2006. This situation indicate that many of firm in Malaysian industries cannot capable the suitable skills of workers. Different in Clerical Workers categories for example total job vacancies registered in 2004 is 11,799 vacancies in 2004 and increased 15,684 vacancies in 2006 but total job seekers in this categories greater than total vacancies is 31,803 peoples in 2004 and increased to 41,288 peoples in 2006. Placement of registrants is very small as only 1,730 placements in 2004 to 5,011 placement in 2006.

Thus this study aims to provide a comprehensive analysis by looking at fifteen major sectors in two digit levels indexed industries with reference to Malaysia Standard Industrial Classification 2000 (MSIC 2000). Focuses in fifteen major sectors allowed us to look at the overall picture of changes demand for occupation in Malaysian labour market during period 2002 to 2007.

The second issues that this study attempt to address is the issues in education sector. As stated in human capital theory, education sector is considered as the main sector to be emphasised in order to achieve sustainable of growth. In Malaysia for example, attention for this sector has been made since Sixth Malaysia Plan. In Seventh and Eighth Malaysian Plan, Government has invested 26.7 percent and 25.1 percent from the total government expenditure respectively in education sector, this amount is relatively high compared to other expenditure. However, this sector seems to be struggling with the quandary in lack of skilled workers and even if there is to be any increase in the number of skilled workers during the period 2002-2007, the number is insignificant. Apparently, Malaysia labour force with tertiary education accounts for only 23.4 percent compared to Singapore and Republic of Korea (ASEAN country) with more than 35 percent. Based on the report in Tenth Malaysia Plan (10MP), 77 percent of

Malaysia workforce has only SPM qualification or equivalent education of only up to 11 years of basic education. In 2008 share of skilled labour for Malaysia was only 28 percent and in the same year Malaysia labour productivity was 26.6 percent. As reported by World Bank (2005), skill shortage is a very severe problem in Malaysia and the main reason being the lack of skill in information technology apart from the lack of professional and technical skill. One of the question posed in this study is whether share of skilled workers in Malaysian labour market affects firm through sector specific shocks (trade effect) or factor specific shocks (technological effect). Another issue raised is on the reforms of the Malaysia education sector.

1.4 Objective

In general, the study aims to identify the causes of the changes of demand for occupation in Malaysia labour market during 2002 to 2007. In order to provide overall picture of changes demand for occupation in Malaysia labour market during the sample period, this study was chosen 15 major industries at the first stage of analyses. At the second stage of analyse, education sector was chosen due to this sector is known as a critical sector to develop sustainable in human capital and economic growth. More specifically, the objectives of the research are as follow:

1. To analyze the causes of changes in demand for occupational differentials in fifteen major industries.
2. To analyze the causes of changes in demand for occupational differentials in education sector.

1.5 Significance of Study

In the thesis we have documented the major changes that have taken place through the 2000s in Malaysia. These changes were associated with the shift from and agriculturally-based economy to one with a strong and expanding knowledge base. The major structural changes reported were the result of major government interventions in the form of a series of National Plans designed to lead the country to the status of a developed nation by the year 2020.

The impact of these structural changes on occupational differentials was described in Chapters 2 and 5. In summary, Malaysia has experienced a significant increase in employment, especially for employees, during the period. Especially significant here are the growth of jobs in electrical manufacturing and the manufacture of electrical machinery. Perhaps the most significant development within these industries, but which is evident in others within manufacturing, is the growth of production jobs and professional and technical occupations. The former is key in understanding what has happened to the Malaysian economy during the period. Basically, the main source of new employment has been in secondary levels of education. Nevertheless, the growth of employment has been associated with increasing levels of education and training for both men and women and this is especially the case at the secondary education level, but also at the tertiary level as well. Thus, Malaysia now has more production workers, these are now undertaken by people with secondary levels of education.

This study considered the impact these changes have had on occupational differentials consistent pattern emerges (see chapter 4). Using simple measures of descriptive, we find that the gap between the top decile and the median has fallen over time whereas there has been an increase between median earnings and those at the lowest decile. Consequently, people at the bottom end of the income distribution have become worse off whereas people on middle incomes have benefited from the structural changes taking place. This trend is evident generally but also across different education groups, occupations and sectors. Perhaps the one exception is that amongst managers and senior administrators, it is the top decile that has benefited from the changes taking place.

The structural changes that have taken place in Malaysia provide the basic data, the main purpose of the thesis is to then explain why these changes have taken place. The significant literature within which this thesis is placed suggests two possible explanations. First, that the changes were brought about by changes in the pattern of trade (linked to the various government plans that were introduced to encourage exports or trade generally or as a result of globalisation). Second, that they reflect changes in technology, which themselves may be associated with changes in the pattern of trade.

Both can be explained using a HOS model as presented in Chapter 4. In contrast to most studies in this area, the present analysis focuses on micro level data which is individual employee data taken from a number of Household Income Surveys (HIS). This type of analysis contribute a huge significant to research area especially dealing with the individual data. Analyses on HIS allow us to look at the deeper impact in occupational structure.

More specifically the research has attempted to achieve three objectives. The first is to determine the causes of occupational differential using a decomposition approach. The second is to determine which factor (trade or technology) is dominant in affecting occupational differential. The final objective is to analyse the effects of trade and technology by employment and wage structure. An understanding of the changes reported and the role of technology and trade are essential to policy-makers, unions and economists. Such an understanding can provide explanation of what has happened to the Malaysian labour market following the changes in policy and structural change during the 1980s to 2000s

1.6 Scope and Limitation

The study covers the period 2002 until 2007 and will observe the structural demand for occupation in fifteen major industries and detailed observation in the education industries. Overall, the research uses data from HIS, a household income survey provided by Malaysia Department of Statistics (DOS) which will enable a detailed analysis of the changing nature of labour demand over time. The selection of HIS data from year 2002 until end of 2007 is done to allow concentration on recent data and also the availability of the data. Another relevant reason for such selection of data is due to the fact that during those years Malaysian economy had undergone structural changes, from industrial economics to knowledge economics. In addition starting from the years 2000s Malaysia economy policy focuses on knowledge based economy and aspires to be among the high income economy by 2020 through rapid growth in technology application in several industries. There is no HIS survey done in year 2000. The years in 1970's, 1980's and 1990's are not covered because variable definitions and measurement in those years' data are different from that of the later years which cannot

be reconciled. Data on education is not complete and many sub-sectors in this industry are too small to contribute.

1.6 Organization of The Thesis

This study is organized as follow:

Chapter 2 describes Malaysia's economic background. It provides brief discussion on the performance of Malaysia economy focusing on the trend of economic transition, from agriculture to industrial and finally to knowledge based economy which leads to the factors that change the composition of occupations in several Malaysian industries. Second, this chapter gives background trends of labour in Malaysia including distribution of employment occupation by industries.

The chapter 3 emphasis on the literature of the empirical studies related to changes in occupational structure which provides evidence for a variety of developed and developing countries.

In Chapter 4, this study presents the data description, theoretical model and methodology used in this study. The theoretical foundations on the causes of changes in the structure of occupational differentials are presented in Chapter 3. The trade hypothesis is theoretically explained using the Heckscher-Ohlin-Samuelson (HOS) model. This model is able to capture the changes in trade and the indirect impact of technological change associated with the sector bias of technological change. The relative demand for occupation is measured using the decomposition techniques. Following the extended decomposition approach by Manasse *et. al* (2004), the study uses both employment and wage data and they are evaluated together.

Results and discussion will be presented in Chapter 5. The main findings shows that factor specific shock (within effects), such as change in the relative productivity of skilled workers due to skill biased technical progress decrease the demand for professional workers and increase the relative demand of technical workers for fifteen major industries during the period of study. On the other hand, this chapter will deal with the factors that changes relative demand for professional and technical workers in education industry. Specifically, this chapter provides a detail analysis and how the skill structure is varied in different industries.

A summary of the main findings and the policy implications and recommendations that follow from the empirical analysis are presented in Chapter 6. As we shall see, the Malaysian government has pursued various policies and national plans in order to achieve economic growth and its goal towards becoming one of the high income countries by 2020.

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