EFFECTS OF HUMAN RESOURCE CAPABILITY, PRODUCTION PLANNING SYSTEM, TECHNOLOGY AND ORGANIZATIONAL CULTURE ON SME'S PERFORMANCE IN WEST JAVA

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ABSTRACT

This study, in particular, addresses the gap in the effect of Human Resource Capability (HRC), Production Planning System (PPS), Technology (TECH) and Organizational Culture (OC) on the performance of the automotive- and –metal-sectors- based SMEs in West Java. Earlier literature shows that scholars have conducted various studies on these variables individually, but this might not reflect the whole picture. This study investigated the effects of HRC, PPS, Technology, as independent variables, and OC as a mediating variable on Organizational Performance (OP). The theoretical framework of this study used a Resource-based View (RBV) and Dynamic Capabilities (DC). The research instrument consisted of 92 items adapted from previous studies. Out of 370 sets of questionnaires distributed, 360 (97.30%) were usable. The research employed the systematic sampling technique and the AMOS 21 software to draw and make conclusions. The findings support the belief that a specific combination of strategic HRC, PPS and TECH factors improve OP. These results are in line with previous research studies, which agree that HRC, PPS and TECH lead to improved OP. The current findings indicate that RBV and DC lend support in describing the effects of HRC, PPS, TECH and OP, directly or indirectly, through OC. The study suggests important implications for practitioners in building and strengthening the competitive approach of their organizations in the hyper-competitive environment of SMEs. This finding will be useful to government agencies in making new policies to support strategic plans, to increase performance and contribution to GDP which will create jobs, and encourage the development of SMEs to have global competitiveness, as the main targets of the strategic plan of the industry in West Java.

Keywords: Human resource capability, production planning system, technology, organizational culture, organizational performance, SMEs.

ABSTRAK

Kajian ini secara khusus membahaskan jurang mengenai pengaruh Keupayaan Sumber Manusia (HRC), Sistem Perancangan pengeluaran (PPS), Teknologi (TECH) dan Budaya Organisasi (OC) terhadap prestasi PKS sektor automotif dan logam di Jawa Barat. Kajian kepustakaan sebelum ini menunjukkan bahawa para sarjana telah melakukan pelbagai kajian mengenai pemboleh ubah-pemboleh ubah ini secara berasingan. Namun, ini mungkin tidak mencerminkan gambaran secara keseluruhan. Kajian ini meneliti pengaruh HRC, PPS, Teknologi, sebagai pemboleh ubah bebas, dan OC sebagai pemboleh ubah pengantaraan terhadap pencapaian organisasi (OP). Kerangka teori kajian ini menggunakan Sudut Pandangan Berasaskan Sumber Daya (RBV) dan Kemampuan Dinamik (DC). Instrumen kajian terdiri daripada 92 item yang diadaptasi daripada kajian sebelumnya. Sejumlah 370 soal selidik telah diedarkan dan hanya 360 (97.30%) soal selidik boleh digunakan. Penyelidikan ini menggunakan teknik persampelan sistematik dan perisian AMOS 21 dalam membuat kesimpulan. Penemuan juga menyokong keyakinan bahawa gabungan tertentu antara faktor strategik HRC, PPS dan TECH dalam memperbaiki OP. Keputusan ini sesuai dengan kajian sebelum ini, yang bersetuju bahawa HRC, PPS and TECH menyebabkan OP bertambah baik. Penemuan kajian menunjukkan bahawa sokongan RBV dan DC dalam menggambarkan kesan HRC, PPS, TECH dan OP, secara langsung atau tidak langsung melalui OC. Kajian tersebut menunjukkan implikasi penting bagi pengamal dalam membina dan mengukuhkan pendekatan kompetitif organisasi mereka di persekitaran PKS yang hiperkompetitif. Penemuan ini akan memberi manfaat kepada agensi-agensi kerajaan dalam membuat dasar baru untuk menyokong pelan strategik, untuk meningkatkan prestasi dan sumbangan terhadap KDNK. Ini dapat mencipta peluang pekerjaan, mendorong pembangunan PKS yang mempunyai daya saing global iaitu sebagai sasaran utama pelan strategik industri di Jawa Barat dapat direalisasikan.

Kata Kunci: Keupayaan Sumber Manusia, Sistem Perancangan Pengeluaran, Teknologi, Budaya Organisasi, Pencapaian Organisasi, PKS.

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LIST OF ABBREVIATIONS

AEC	ASEAN Economic Community
AGFI	Adjusted Goodness of Fit Index
AMOS	Analysis of Moment Structure
AMT	Advanced Manufacturing Technology
ASEAN	Association of Southeast Asian Nations
BPS	Biro Pusat Statistik (Central Bureau of Statistic)
CFA	Confirmatory Factor Analysis
Cr.	Critical ratio
CR	Composite Reliability
AVE	Average Variance Extracted
CFI	Comparative Fit Index
DC	Dynamic Capabilities
DF	Degrees of Freedom
FCIC	Financial Crisis Inquiry Commission
ILMATE	Industri Logam, Mesin, Alat Transportasi, dan Elektronika (Metal Industry, Machine, Transportation Tool, and Electronic)
GDP	Gross Domestic Product
GFI	Goodness of Fit Index
HRC	Human Resource Capability
KBLI	Kelompok Baku Lapangan Usaha Indonesia
KSA	Knowledge, Skill, Attitude
MLR	Multiple Linear Regressions
MSI	Method of Successive Interval
OC	Organizational Culture
OP	Organizational Performance
PPS	Production Planning System
RBV	Resource Based View
RFID	Radio Frequency Identification
RMSEA	Root Mean Square Error of Approximation
RMSR	Root Mean Square Residual
SD	Standard Deviation

SEM	Structural Equation Model
SMEs	Small and Medium Enterprises
SPSS	Statistical Package for the Social Sciences
SR	Structural Regression
SV	Scale Value
TLI	Tucker-Lewis Index
TSV	Transformed Scale Value
TT	Throughput Times
TECH	Technology
VIF	Variance Inflation Factor
WIP	Work In Progress

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

Industry and trade are amongst the most important sectors in the economy of any country. These sectors serve as the driving force of the economy and a source of livelihood and community development. Since September 2008, the global financial crisis has dramatically impacted the economy of most countries around the world. To turn such adversity into opportunity, firms are required to increase their efficiency, reduce waste and consistently invest in innovation (Financial Crisis Inquiry Commission (FCIC) Report, 2011; Honohan, 2010).

The impact of the crisis affected the performance of organization sustainable at service sector and manufacturing industry (Setiawan and Ika, 2012; Wijaya, 2008; Biro Perencanaan, 2015). Furthermore, the continuous performance of an organization is crucial as it determines whether pre-determined targets can be achieved (Goffin and Perkins, 2009). In order to ensure the efficacy of an organization in securing long-term sustainable development and dealing with change, it is of utmost importance to have a strategic balance in the decision-making process (Babeľová and Vaňová, 2014).

Some of the studies on the measurement of organizational performance were conducted at large companies and small enterprises. In large companies performance measurement research conducted on the related to the wider financial controls, availability of reports, and indicators concerning large companies, allowing more accurate projections (Schmalensee, 1985, McGahan and Porter,1997; Gimenez, Veiga & Duclos, 2016). In SMEs, some limiting factors hinder projections based on reports. These limitations include the human resource capability (manager), technological limitations, the centralization of decisions, the number of people, scarcity of resources and other factors that hinder internal controls and the measurement of results and performance (Dess and Robinson, 1984; Rumelt, 1991; Biro Perencanaan, 2015; Oyemomi, Liu, Neaga, & Alkhuraiji, 2016).

Manufacturing industry sector is one of sector that is a key contributor to the GDP, as an indicator of economic progress in Indonesia. Therefore, the government seeks to increase the competitiveness of the manufacturing industry sector, particularly the automotive industry and the SME sector a metal that can withstand global crisis era (Biro Perencanaan, 2015). Manufacturing industry is defined as an economic activity processing basic goods chemicals, mechanically or manually into intermediate or final goods. Its also defined as processing of lower value goods into higher value goods as final or intermediate products. The activities also include services for manufacturing and assembling (Centre Bureau of Statistic, 2016). Manufacturing industries are categorized into four groups, based the number of employees; large scale manufacturing (100 employees or more), medium scale manufacturing (20 – 99 employees), small scale manufacturing (5 – 19 employees), and micro industri (1 – 4 employees) (Centre Bureau of Statistic, 2016).

The role of SMEs in developing countries is far more important than the developed countries, particularly regarding employment and generation of revenues. Small and medium industries have a role in terms of employment, income generation, and as a driver of the local economy, (Zahra & Covin, 1995; Kotey & Meredith, 1997; Tambunan, 2002: Wenagama, 2013; Biro Perencanaan, 2015). Small and Medium-sized Enterprises (SMEs) in Indonesia are facing the challenge of organizational performance resources in global competition.

Nevertheless, Indonesia's automotive industry has huge potential for growth. Data from Cooperative Automotive Components Industry Indonesia found that 70% of industrial components are produced by Small and Medium Enterprises (SMEs) (Suryawirawan, 2014). The sector, with a workforce of two million, need to continuously train its employees so as to ensure Indonesia remains competitive in the ASEAN Economic Community (AEC; ASEAN is the Association of Southeast Asian Nations), and the global market (Suryawirawan, 2014).

Organizational growth depends on continuous improvement. Among factors that affect Organizational Performance are workers' motivation, leadership, total quality management, external environment, organizational capabilities, organizational culture and resources (Corina, Roxana & Liviu, 2012; Davidson, Coetzee & Visser, 2007; Ejere and Ugochukwu, 2013; Sokro, 2012; Thang and Quang, 2011; Tuan and Yoshi, 2010; Zakuan, Yusof, Laosirihongthong, & Shaharoun, 2010).

An extensive research work has been carried out to examine the relationship between above mentioned factors and organizational performance. The literature shows that many researches studies have been carried out in developed countries (Rauch, Wiklund, Lumpkin, & Frese, 2009), but very few in the context of developing countries, especially in Indonesia.

SMEs are considered as the backbone of country's economic growth. They contribute greatly to national development and wealth creation (Lazányi, 2014). Infact, these small and medium enterprises represent as a potential element for economic prosperity and growth in advanced industrialized and emerging economies (Robu, 2013). The following sub topic discusses about SMEs automotive and metal sectors in West Java.

1.2 Background of SMEs Automotive and Metal Sector in West Java

West Java is one of the provinces in Indonesia. West Java Province is still considered important because it becomes one of the largest industrial areas in Indonesia so it is expected that the new government will be elected to strengthen the potential of the industrial sector in West Java. Based on the data of the Ministry of Industry indicates if West Java Province has the largest number of industries in Indonesia. The number of Provinces in Indonesia is 34 Provinces stretching from Sabang to Merauke (Centre Bureau of Statistic, 2016). The number population and capital city can be seen in the following table 1.1.

Table 1.1

Number capital city, its area and industry populations in Indonesia

No.	Province	Capital City	Its Area (km^2)	Population
1	Aceh	Banda Aceh	56,500.51	71
2	North Sumatra	Medan	72,427.81	1,376
3	West Sumatra	Padang	42,224.65	194
4	Riau	Pekanbaru	87,844.23	382
5	Jambi	Jambi	45,348.49	179
6	South Sumatra	Palembang	60,302.54	230
7	Bengkulu	Bengkulu	19,795.15	60
8	Lampung	Bandar Lampung	37,735.15	415
9	Bangka Belitung Islands	Pangkalpinang	16,424.14	132
10	Riau islands	Tanjungpinang	8,084.01	560
11	DKI Jakarta	Jakarta Pusat	740.29	1,645
12	West Java	Bandung	36,925.05	8,676
13	Central Java	Semarang	32,799.71	4,861
14	Special Region of Yogyakarta	Yogyakarta	3,133.15	440
15	East Java	Surabaya	46,689.64	8,021
16	Banten	Serang	9,018.64	1,509
17	Bali	Denpasar	5,449.37	430
18	West Nusa Tenggara	Mataram	19,708.79	133
19	East Nusa Tenggara	Kupang	46,137.87	41
20	West Kalimantan	Pontianak	120,114.32	180
21	Central Kalimantan	Palangkaraya	153,564.50	125
22	South Kalimantan	Banjarmasin	37,530.52	152
23	East Kalimantan	Samarinda	230,277.00	167
24	North Kalimantan	Tanjung Selor	85,618.00	87
25	North Sulawesi	Manado	13,930.73	117
26	Central Sulawesi	Palu	68,089.83	99
27	South Sulawesi	Makassar	46,116.45	417
28	Southeast Sulawesi	Kendari	36,757.45	101
29	Gorontalo	Gorontalo	12,165.44	34
30	West Sulawesi	Mamuju	16,787.19	19
31	Maluku	Ambon	47,350.42	62
32	North Maluku	Sofifi	39,959.99	11
33	West Papua	Manokwari	114,566.40	21
34	Papua	Jayapura	309,934.40	9
Total			1,980,051.83	24,529

Source: Centre Bureau of Statistic, 2016

Of 74 industrial areas spread in Indonesia, including donated from West Java Province as many as 40 industries. If viewed from the side of the area that reached 31,000 hectares of industrial area in the country then 23,000 hectares of them are in West Java Province. Thanks to this industry sector also makes West Java became the third largest contributor of gross domestic product (GDP) reached 14.07 percent after Jakarta by 16.40 percent and East Java by 14.88 percent (Centre Bureau of Statistic, 2016).

According to Hidayat (2013) and the Centre Bureau of Statistic (2016), the industrial sector is the major component of the Indonesian economy in general, it continues to grow in the midst of an unstable global economy. Annually, growth in 2011 to 2015 was 6.17 percent, 6.03 percent, 5.56 percent, 5.02 percent and 4.79 percent, respectively. Although there is on-going global uncertainty about the deteriorating performance of national trade balances, the Indonesian economy continues to grow, its GDP in the period of 2011-2015, value of GDP of Indonesia on basis of prices applicable represents a significant increase of USD 641.94 billion (2011); USD 706.21 billion (2012); USD 782.47 billion (2013); USD 866.05 billion (2014) and USD 945.97 billion (2015) (Centre Bureau of Statistic, 2016).

In 2015 the services sector amounted to USD 24.31 billion, while the construction sector reached a record at USD 20.95 billion (Centre Bureau of Statistic, 2016). This was followed by the financial, real estate, and business services sector at USD 16.09 billion alongside the transport and communications sector at USD 15.66 billion and, finally, the electricity, gas, and water sector amounted to USD 1.74 billion.

Meanwhile, West Java province is one of the major contributors to the national economy, contributing about 14.38% of the total GDP (Central Bureau of Statistic, 2016). Industry is the major sector of the economy, making the largest contribution to economic growth in West Java. The Gross Domestic Product (GDP) at Indonesia for 2015 was USD 25.60 billion (Centre Bureau of Statistic, 2016), and the manufacturing industry contribute USD 8.59 billion (34%), (Centre Bureau of Statistic, 2016).

The manufacturing sector in West Java comprises 22 industrial groups, scattered among 17 regions and nine cities (Centre Bureau of Statistic, 2016). There are as many as 203,312 SMEs and large industry in this province, making it the industry's barometer for Indonesia. Nearly 90% of automotive and electronics based SMEs are located in West Java, with automotive products representing a total of 6 million in 2015 (Centre Bureau of Statistic, 2016). The number of Small and Medium Industry Units in West Java can be seen in the following table 1.2.

The Industry and Trade Department of West Java continues to encourage SMEs to be engaged in the manufacturing of components or parts for motor vehicles (Centre Bureau of Statistic (2016). In 2015, the number of workers involved in the metal, machinery and electronics industries in the province was 302,212. SMEs that are related to the metal, machinery and components industries located in a number of cities/districts in West Java produced a majority of the products required to meet the needs of the larger industry (Centre Bureau of Statistic, 2016). Figure 1.1 below illustrates the location of SMEs in West Java.

Table 1.2

Number of Small and Medium Industry Units in West Java

No.	Regions / Cities	Industry Units	Labor
1	Bogor	14,975	338,687
2	Sukabumi	15,471	214,278
3	Cianjur	1,244	159,294
4	Bandung	13,483	189,850
5	Garut	9,813	168,188
6	Tasikmalaya	1,480	171,899
7	Ciamis	1,408	189,917
8	Kuningan	2,430	191,760
9	Cirebon	10,699	88,972
10	Majalengka	7,396	143,681
11	Sumedang	5,130	159,477
12	Indramayu	2,377	123,391
13	Subang	3,410	140,693
14	Purwakarta	10,850	117,395
15	Karawang	9,341	215,580
16	Bekasi	10,704	194,221
17	Bandung Barat	52	2,251
18	Kota Bogor	8,227	268,543
19	Kota Sukabumi	9,436	130,131
20	Kota Bandung	10,821	121,120
21	Kota Cirebon	9,379	158,320
22	Kota Bekasi	9,891	107,582
23	Kota Depok	10,308	165,573
24	Kota Cimahi	6,112	187,215
25	Kota Tasikmalaya	9,734	118,064
26	Kota Banjar	9,248	155,203
Total		203,419	4,221,285

Source: Centre Bureau of Statistic, 2016

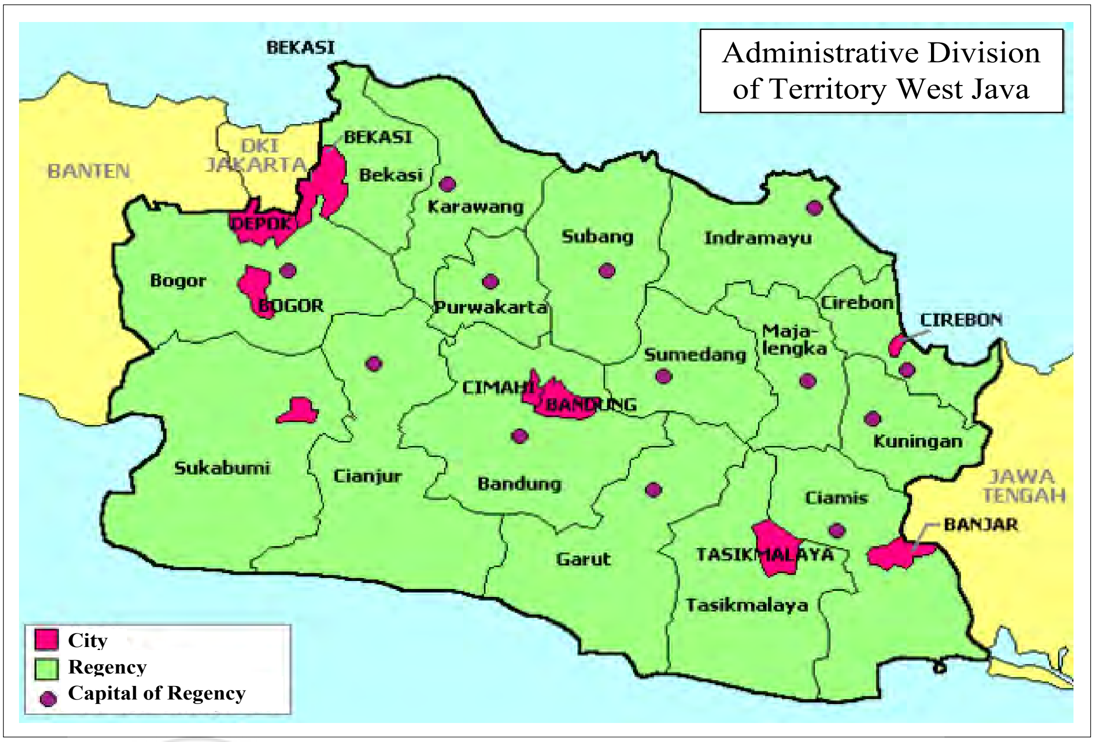

Figure 1.1
Map of Small and Medium Industry Business Units in West Java Province
Source: Centre Bureau of Statistic, 2016

Sofwan (2013) and Centre Bureau of Statistic (2016) described the components or spare parts industry in the West Java region are scattered through Bandung, Cimahi, Sukabumi, Cianjur, Purwakarta, and Bogor. As with most SMEs, the problems faced by SMEs in the automotive and metals sector in West Java are the capability of human resources (manager), technological limitations, decision centralization, the number of people, resource scarcity and other factors that hinder the control and measurement of results and Performance.

Specifically, the spare parts produced can be categorized to four grades. Grade 1 and 2 purchased by major manufacturers and grade 3 and 4 by part stores (Centre Bureau of Statistic, 2016).

1.3 Organizational Performance (OP)

Organizational Performance in the automotive and metals sector encompasses (Richard, Devinney, Yip & Johnson; 2009): 1) shareholder return (total shareholder return, economic value added, total business return); 2) financial performance (profits, return on assets, return on investment, return on equity, return on net asset, earning per share) and 3) product market performance (sales, market share, total market growth, market value added, product regulation). Wibisono (2011, 2006) described performance management systems as divided into three perspectives; a) business result, b) internal business process; and c) resource availability. An important aspect of any performance management system is indeed performance measurement, which is the constant monitoring of organizational dimensions relevant to the performance management system (O'Boyle and Hassan, 2014). Performance measurement is a process by which an organization monitors important aspects of its programmes, systems and processes (Fox, Yamagata & Harris, 2014). Performance management is embedded in various private and public entities and it has evolved steadily since the mid-1990s (Ferlie and Steane, 2002).

Meanwhile, Cooper, Kaplan, Maisel, Morrisey, & Oehm (1992) and Maelah (2009), described the limitations of the financial measurement system, while Kaplan and Norton (1996) described the shortcomings of the conventional performance measurement system in producing sufficient information. The latter argued that the delayed, aggregated, and distorted information produced through the conventional measurement system had made managers unable to make better control decisions.

Kaplan (1983) developed a performance measurement model known as the Balanced Scorecard (BSC). The measurement of corporate performance by the BSC approach is divided into four perspectives: (1) Financial Perspective, (2) Customer Perspective, (3) Internal Business Process Perspective, and (4) Learning and Growth Perspective.

Baldrige (1987), U.S. Minister of Commerce under President Reagan, identified the criteria that are suitable for use as a measuring tool, naming them the Malcolm Baldrige Criteria for Performance Excellent (MBCPE), hereinafter referred to as Malcolm Baldrige National Quality Award (MBNQA). MBNQA is a set of criteria used to measure the comprehensive performance of the company, covering all management functions including aspects of the approach and dissemination of the company, of which the level of effectiveness can be seen from the business outcome. Success rate is determined by comparing a firm's performance against the best companies in the field, known as benchmarking. In the MBNQA concept, the emphasis is on two-dimensional measurements: the process and the outcome.

The following topic discusses about human resource capability (HRC), as one of major factors by which an enterprise's performance and competitiveness can be measured is the competency of management (Karami, 2012; Papulova and Papulova, 2006; Salonen, 2010).

1.4 Human Resource Capability (HRC)

Automotive and metals sectors have capability of human resources that are not yet optimal and number of limited labor to be able to compete in global market. Therefore a growing number of academics and practitioners are seeking to examine the association between human resources and OP. This is to determine how human resources are affecting the market value of a firm (the firm's market valuation), although the effects may not be shown in the company's financial statements (Lev, 2001; Micah, Ofurum & Ihendinihu, 2012).

Porter (1990) stated that a company will achieve superior performance and gain competitive advantages if it is able to attain resources that are difficult to be imitated by competitors. In fact, the traditional assets of company such as natural resources, technology and economies of scale can progressively decrease the competitiveness of a firm if rival firms are able to emulate them. Human resources are becoming one source of competitive advantage.

Furture, human resources must relate to the needs of the firm (Wright, McMahan, & McWilliams, 1994; Walsh, Sturman & Longstreet, 2010). Qualified personnel enable it to address market needs better in terms of quality of products and services produced, product differentiation and technological innovation (Alnaqbi, 2011). The human resource is not seen as mere resource, but rather as capital or assets of a firm. As a major valuable asset, it can be multiplied and developed (compared to portfolio investment) and not seen as a liability (burden, cost). Therefore, it is always regarded as an investment if a firm to be highly competitive (Greer, 1995; Mohammed, Bhatti, Jariko & Zehri, 2013).

According to Stoner and Wankel (1986), Terry and Franklin (1982), Werther and Davis (1996), human resource is one of the resources that a firm own. Compared with other elements, the human element is the most dynamic and complex (Dessler, 2008;

Ijose, 2010; Breznik, 2014). The notion surrounding the distinctive importance of human resource is derived from the concept of considering human resource as the main source of sustainable competitive advantage for the organisation (Kakabadse, Kakabadse & Myers, 1998; Mabey, Salaman & Storey, 1998).

The four necessary prerequisites are: human capability and commitment (Analoui, 1998a); the strategic importance of human resources (Kakabadse et al, 1998), management human resources by specialists, and integration of human resource management in business strategy (Boxall, 1992).

Human resource capability can be defined as the routines embedded in the implicit knowledge and tacit of members of an organization functioning to deploy, and redeploy human resources, develop, nurture, acquire, in a dynamic, competitive environment (Boxall 1998; Kamoche 1996; Teece et al. 1997; Ulrich and Lake 1990) The Resource-Based View (RBV) identifies HRC dimension as; skilled human resource, innovative human resource, human resource effectiveness, training competent employees and human resource commitment (Karami, 2004; Dyer and Reeves, 1995; Analoui, 1998a). Wright, McMahan, McCommick & Sherman (1998), also defines the skilled workforce as a HRC, while Analoui (1998b) included managerial skills like self-development and analytical capability.

The production system is another important factor, and its relationship with OP is investigated in this study. The following section discusses about production planning system (PPS).

1.5 Operation Management

According to Kumar and Suresh (2009) operations department of an organization is responsible for the production of quality goods and services. Management is a transformational process of various operational resources of the organization into valuable goods and services as per the organization's policies. Production management is the arrangement of management activates, involved in the manufacturing of products. Application of this concept to the activities of services management is called as operations management (Kumar and Suresh, 2009).

As per view of Simons (2013), the scope of operations management has three main aspects: a) production planning system, b) production system control, c) production system information. However, to produce a high-quality product, a firm should adopt an appropriate production strategy.

1.5.1 Production Planning System (PPS)

Continuous improvement of production and innovation triggered by technological developments in the automotive and metals sector needs to be supported by good production planning system, so that SMEs can compete in the global market (Biro Perencanaan, 2015). PPS is an important aspect especially for a firm that produces components. This is an activity where resources that flow into the system is defined, combined and modified in a controlled way to add value in accordance with the policy communicated by management (Kumar and Suresh; 2008). According to Bufaa and Sarin (1987), production system refers to a set of resources and procedures involved in converting raw material into products and delivering them to customers. Heizer and Render (2011) coined it as operations management.

In this study, PPS is considered and its effects on OP will be measured. The following section discusses another factor of this study that is technology.

1.6 Technology

Technological developments encourage continuous improvement of production and innovation in the automotive and metal sectors in order to compete in the global market (Biro Perencanaan, 2015). Khurana (2013) defined technology as the knowledge, usage and making of systems, machines, crafts, tools, techniques and methods used by an entity in order to solve an issue or perform a particular function. Technology plays a very important role especially in a competitive market, improving competitive advantage through its role in determining product cost or creating differentiation. Technology is also a tool to increase productivity of the human resource in order to exploit, control and develop natural resources (Kadiman, 2008; Simon and Shallone, 2013).

Calori and Sarnin (1991) claimed that technology enables an organization to create innovative processes, product innovation, and adapt to new market segments that will lead to increased market share and market size. Increased market share and size will also result in increased economies of scale and learning effects which later lead to reduction of costs. In the manufacturing sector, the pivotal importance of technological innovation to improve resource productivity and environmental performance has become particularly apparent (Hollen, Van Den Bosch, & Volberda, 2013).

According to Dolinšek and Štrukelj (2012), most people widely use technology for their benefits and believed that technology has a significant impact on their lives. It acts as a beneficial source for our lives especially related to health. Numan (2005a) described technology as a combination of physical equipment and knowledge relating to the manufacturing industry. Meanwhile, Pieterse (2001) described technology as a triangle consisting of three components that interact with each other and are interdependent, humans, science and physical tools.

In this study, technology will be used as a single variable and measured against OP. The following section discusses another factor investigated in this study, OC.

1.7 Organizational Culture (OC)

HRC, continuous improvement of production and innovation fueled by technological developments, and good PPS in automotive and metals sectors are expected to generate a good organizational culture for SMEs to compete in global markets (Biro Perencanaan, 2015). The term was introduced by Andrew Pettigrew (1979), who used it to describe a system of meaning that is publicly and collectively accepted and which is valid for a certain time for a certain group of people. OC has a leading position among the components that are considered as essential for sustainable SMEs performance, gaining a competitive edge and a strong reason for the SMEs to outperform and to be un-owned as great firm (Madu, 2012). Shared values, beliefs, expectations, assumptions and norms are factors that make OC and keep the system and people together that distinguishing the organization from other organizations (Schein 2010, Robbin, 2006).

Denison (1990) said OC has underlying principles, values and beliefs which work as the basis for the management system of an organization and also as a set of behaviours and practices for management that both reinforces and exemplifies those basic principles. OC can be the foundation for crisis management as it is an important dimension present at institutional level (Wang, Hutchins & Garavan, 2009).

Nazir and Lone (2008) described OC, as an internal organizational variable, influencing OP and effectiveness and indeed, every aspect of organizational life (Rauch e al., 2009). It affects organizational behaviour and posture in relation to the external environment (Rashid and Sambasivan, 2003; Sokro, 2012). The literature confirms direct and indirect effects of OC on OP (Chuang, Morgan, & Robson, 2012; Nazir and Lone, 2008; Sokro, 2012).

This study proposed OC as a mediating variable between HRC, PPS, technology and OP. The following section discusses the problem statements derived from these factors.

1.8 Problem Statement

It is obvious that firms are affected by unstable global business environment. In order to survive in a volatile environment, firms need to be able to address, face and adapt changes. When faced with precarious and unstable situation, every organization needs management capability to secure success (Verboncu and Purcaru, 2009).

Based on various opinions, performance can be described as: 1) level of achievement from implementation of certain tasks; 2) level of achievement on materializing corporate objectives; 3) overall activities performed to improve performance of a firm which include performance of each individual and/or group; and 4) individual performance, group performance and/or corporate performance which are influenced by internal and external environments (Mathis and Jackson, 2005; Schroeder, 2000; Mangkunagara, 2007).

In the context of Indonesian business and economy, strategic factors such as HRC, PPS, technology and OC have been identified as key factors that affect firms' success. Indonesian government has prepared various national programs to enhance competitiveness, improve product quality and performance of SMEs (Biro Perencanaan, 2015, Bappenas, 2014; DJ-ILMATE Report, 2015). Furthermore, to achieve national goals and programs, business operators and metals sector of the automotive industry need to ensure that appropriate organizational strategies implemented and sustained in order to achieve better organizational performance. Studies show that problems faced by SMEs in achieving better performance and enhance the competitiveness of its limited human resources with good quality, technology and production planning as well as an organizational culture that is conventional (Tambunan, 2002; Effendi, 2005; Biro Perencanaan, 2015; Dinas Perindustrian, 2013). Nevertheless, Indonesia's automotive industry has huge potential for growth. Data from Cooperative Automotive Components Industry Indonesia found that 70% of industrial components are produced by SMEs (DJ-ILMATE Report 2015). The sector, with a workforce of two million, need to continuously train its employees so as to ensure Indonesia remains competitive in the ASEAN Economic Community (AEC; ASEAN is the Association of Southeast Asian Nations), and the global market (ILO and ADB, 2014; DJ-ILMATE Report 2015) that the biggest challenge facing Indonesian SMEs in global competition is to manage these four factors more strategically.

The competitive business environment has forced the SMEs to compete and strive for best performance. Reliable human resources that are supported by good production systems, reliable technology is expected to improve OP (Kumar and Suresh, 2008; Numan, 2005a; Wibisono, 2012; Heizer and Render., 2011; Schroder, 2011).

This study in particular, addresses the gap on the effect of HRC, PPS, technology and OC on performance of automotive and metal SMEs in Indonesia. Earlier literature shows that the scholars have conducted various studies on these variables individually, but this might not reflect the whole picture. Although, such studies have contributed valuable information to the body of knowledge, research combining all four constructs in one framework is still lacking. Hence, human resource capability, production planning system, technology and organizational culture are crucial factors for the accomplishment performance goals of automotive and metal SMEs in Indonesia.In addtition, such previous studies reveal conflicting finding and thus proposing possible operation moderating that could strength the effect. In this regard, organizational culture could strength the effect between human resource capability, production planning system, and technology on performance goals of automotive and metal SMEs in Indonesia. (Tambunan, 2002; Effendi, 2005; Biro Perencanaan, 2015; Dinas Perindustrian, 2013, ILO and ADB, 2014; DJ-ILMATE Report 2015). Therefore, human resource capability, production planning system, and technology could be three factors crucial of increasing performance goals directly, and organizational culture could be moderating factor in this study. So, with the intention to close this gap, this study investigates the issue from a wider perspective by combining human resource capability, production planning system, technology and organizational culture on performance in one research framework. So, with the intention to close this gap, this study investigates the issue from a wider perspective by combining human resource capability, production planning system, technology and organizational culture on performance in one research framework.

1.9 Research Framework

The sustainable competitive advantage of a firm can be achieved through superior quality of product/services capable of satisfying customers. Figure1.2 illustrates the framework of this research, contributing to achieving this end through better OP. The role of OC is investigated as a mediating variable.

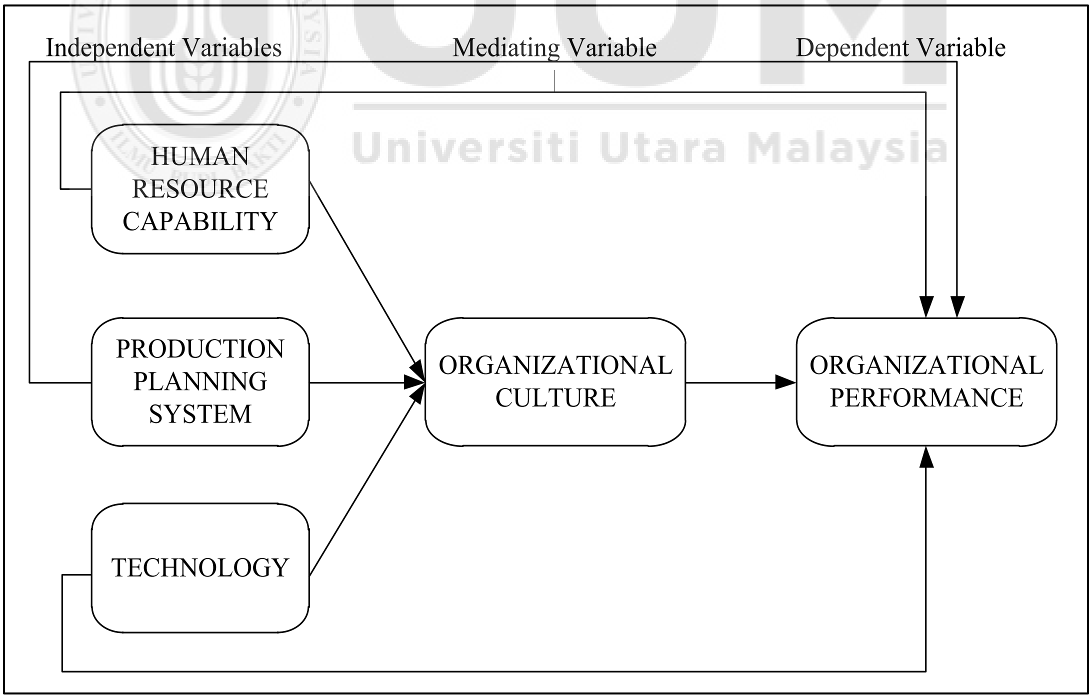

Figure 1.2
Research Framework

1.10 Research Questions

The main research question of this research is concerned with the effect of human resource capability, production planning system, technology and organizational culture on firm performance. The research is guided by the following research questions:

1. What is the effect of human resource capability on organizational performance?
2. What is the effect of human resource capability on organizational culture?
3. What is the effect of production planning system on organizational performance?
4. What is the effect of production planning system on organizational culture?
5. What is the effect of technology on organizational performance?
6. What is the effect of technology on organizational culture?
7. What is the effect of organizational culture on organizational performance?
8. Does organizational culture have a mediation effect on the relationship between human resource capability and organizational performance?
9. Does organizational culture have a mediation effect on the relationship between production planning system and organizational performance?
10. Does organizational culture have a mediation effect on the relationship between technology and organizational performance?

1.11 Research Objectives

The research objectives of this study are specified as below:

1. To analyse the effect of HRC on OP.
2. To analyse the effect of HRC on OC

3. To analyse the effect of PPS on OP.
4. To analyse the effect of PPS on OC
5. To analyse the effect of technology on OP.
6. To analyse the effect of technology on OC
7. To analyse the effect of OC on OP.
8. To analyse the effect of OC on the relationship between HRC and OP.
9. To analyse the effect of OC on the relationship between PPS and OP.
10. To analyse the effect of OC on the relationship between technology and OP.

1.12 Contribution of the Study

This study aims to contribute to SMEs development of West Java besides theoretical and practical aspects for better OP. The contribution is expected to systematically describe the variables associated with this research. This study accentuated the importance of HRC, PPS, technology and organizational culture their causal effect towards organizational performance. It predicted that the adaptability of these combined factors would contribute major impact to the organizational performance. The contribution of the study specifically can be viewed from three perspectives: theoretical, practical, and national economic growth. Below is a brief elaboration on how this study could contribute to the body of knowledge particularly in the process of decision making.

1.12.1 Significance of the Study

This study is important because the results would enable SMEs to perform better in their respective markets. Specifically, it identifies the effects of HRC (Kaplan and Norton, 2004), PPS (Wibisono 2012; Heizer at al., 2011; Kumar et al., 2008), technology (Willmot and McCharty, 2001; Wibisono 2012) and OC (Schein, 2012) on OP (Auginis, 2007; Villere, 2002).

1.12.2 Theoretical Contribution

The result of this study is seen in the theoretical aspects; in the context of strategic combinations of HRC, PPS, technology and OC towards OP. This study contributed to the operation management theory or competitiveness theory development and it envisaged being further input to the process of decision making. This study also adds some insight to literature's and showing the importance of HRC, PPS, technology and OC on organizational performance especially in the automotive and metal sectors of SMEs in West Java.

1.12.3 Practical Contribution

The practical contribution of this study are in providing managers with better insights into how to achieve a more competitive edge, considering HRC, PPS, technology and OC, specifically as effecting performance. This research also contributes to the development of a strategic model for better performance by SMEs. This study determined some imperative issues and the gaps in the literature related to the strategic match of HRC, PPS, technology and OC on organizational performance, especially in the automotive and metal sectors of SMEs in West Java. The findings could enable the managers to formulate and better strategic decisions in order to gain SMEs competitive advantage. For that, this study generated a framework, which could enhance the confidence level and potential of managers for making very concrete decisions as well as mitigate the automotive and metal sectors of SMEs from the intense competition, technological and market turbulence.

1.12.4 Economic Contribution

In order to tap the growth potential of automotive and metal sectors of SMEs in West Java, aspiration of becoming a high-income nation from automotive and metal sectors by 2020, this study provided best strategic practices, planning and decisions that boost the manufacturing industry's competitiveness, quality and SMEs performance. The development of the automotive and metal sectors of SMEs will increase the employment generation, Gross Domestic Product (GDP) and productivity growth.

1.13 Scope and Limitations of the Study

This research focuses on the complex environment of SMEs automotive and metal sector whose main domains are HRC, PPS, technology, OC and OP. Thus, other aspects or factors are excluded from the scope of the study. This need to be done because the automotive and metal sectors have the ability of human resources that have not been optimal and the number of limited labor to be able to compete in the global market. In this research is expected to explain the dominant variables such as good human resource capability, PPS technology and organizational culture that can improve the performance of SMEs automotive and metal sector. It is undeniable that contributions from factors or other problems can affect or provide. Valuable information for the managerial decision making process; If such a situation occurs, it will be regarded as a limitation of research.

1.14 Key Terms

1.14.1 Human Resource Capability (HRC)

Development of SMEs in the automotive and metals sector must be too accompanied by the development of human resources in various aspects such as innovation, skills, effectiveness, commitment and competence (Adriana, Brahmayanti, & Subaedi, 2010). Tracey (2003) describes human resources as the people who manage and operate an organization, in contrast to financial and material resources. In addition, human resource capability refers to the ability to own, obtain or the ability to access the optimal combination of necessary resources, systems and structures necessary to deliver the company's output to match the level of customer specified in terms of performance on an Ongoing course Front (State Service Commission, 1999).

HRC of an SMEs in the automotive and metals sector comprised of access to the skilled people with required skills, abilities, attributes and level of competencies required by the organisation to achieve its strategic goals and deliver required output to its customers (State Service Commission, 1999; Wright, Kroll & Parnell, 1996). HRC (skilled human resources, innovative human resources, human resource effectiveness, human resources commitment, and training for competent human resources) are factors that determine the competitive advantages of a firm (Adriana, Brahmayanti, & Subaedi, 2010; Karami, 2004; Dyer et al., 1995; Analoui, 1999a).

1.14.2 Production Planning System (PPS)

A good production planning system (PPS) can create high efficiency which in turn will increase the company profit. Production planning is closely related to production capacity, available resources ranging from human resource capability, materials, support equipment to supporting departments. The importance of proper planning is because the production planning part should be able to calculate with certainty the resources needed (including the human resource capability) required for production activities, and to be both timely and timely. Production planning should be calculated appropriately in accordance with engine capacity and equipment, resources and supporting facilities such as SMEs of automotive and metal sectors capacity. PPS is a sub part of production management or operations management, which aims to produce goods and services of right quality and quantity at right time and with right manufacturing cost (Heizer and Render, 2011; Jarkas and Bitar, 2011; Sarjono, 2014).

1.14.3 Technology

Currently technology plays a very important role to improve the performance of SMEs and overcome the difficulty of producing quality commodity goods. Likewise with the SMEs of the automotive and metals sector, technology is a collection of techniques, skills, methods and processes used in the production of goods / services or in the achievement of goals (Liddell, and Scott, 1980), technology is the knowledge, use and manufacture of systems, crafts, tools, techniques and methods used by the entity to solve a problem or perform certain functions (Khurana, 2013).

1.14.4 Organizational Culture (OC)

OC has been defined by Denison (1990) as a common norm and value system among employees of the organization and determines their attitudes and approaches to their different problems within the organization. In this study, OC is a system that acts as a mediator for other systems or provide a direct effect for performance improvement

SMEs automotive and metal sectors to have global competitiveness and to increase job creation, Gross Domestic Product (GDP) and productivity growth.

1.14.5 Organizational Performance (OP)

OP has been defined differently by many researchers. This study follows the definitions given by Antony and Bhattacharyya (2010), OP in SMEs as a measure used to evaluate and assess the SME automotive and metal sectors successfully creating and delivering value for both external and internal customers. The performance of SMEs will increase and have high competitiveness if supported by various factors. Supporting factors are HRC, PPS, technology and OC.

1.15 Summary

In this chapter, an overview of the entire research process was provided through clearly stating the problems and issues. The objectives to be achieved were stated with the proposed theoretical framework and research questions whose answer will signify the achievement of particular objective. Finally, scope of the study and its contribution to knowledge were discussed.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

The theoretical model results from the study of theories, a synthesis of concepts (propositions) and the results of previous empirical studies. The literature reviews focuses on the variables identified in the previous chapter.

Wright, kroll & Parnell (1996) described the development of an enterprise as influenced by two factors, the external and internal environmental. The business environment can be divided into three external parts, namely the remote environment, the industry environment and the operating environment.

The remote environment comprises five factors that originate beyond the firm and are outside any single firm's operating situation: (1) economic; (2) social; (3) political; (4) technological; and (5) ecological. This environment provides firms with both opportunities and threats, but rarely does a single firm exert any meaningful reciprocal influence (Kimotho, 2013).

The operating environment, also called competitive or task environment, comprises those factors in a competitive situation that affect OP (Ndegwa, 2012). Generally these are the competitive position of the firm, its reputation among creditors and suppliers, the composition of its customers, and its efficacy in attracting a competitive workforce. In comparison to the remote environment, the focus of the operating environment is on the influence or control of the firm, requiring it be more proactive in its dealings within the operating environment (Bolman and Deal, 2011).

The variables for internal environment have a significant influence on sustainable competitive advantage (Protogerou, Caloghirou, & Lioukas, 2012): (1) human resources, (2) organizational resources, and (3) physical resources. Human resources in particular consist of capabilities, knowledge, experiences, skill and judgement. Organizational resources refer to production, financial, marketing and information systems and research and development. The physical resources are technology, accessibility, distribution network, location, equipment and factory (Karia, Wong, Asaari, & Lai, 2015).

Specifically, this chapter reviews the literature on human resource, production system, technology, organizational culture and performance measurements as well as summarizing prominent theories on all these factors.

2.2 Human Resource

Human resource is the set of individuals who make up the workforce of an organization, business sector or an economy (Schroder, 2000; Kerzner, 2013). The latest thinking views it not as a mere resource, but rather in the form of the capital or assets of the institution; the human resource is not just a major asset, but a valuable one (Greer 1995; Storey, 2014).

In a firm, human resources not only as a tool in production, but they play an important role in production activities (Sandberg, 2000; Knowles, Holton III, & Swanson, 2014). They are not only a means of production but also as a driver, determining the course of the production process and hence all the activities of the firm (Schroder, 2000; Knowles et al., 2014). As major contributor to the development of a company, the quality and capability of the human resources largely determine its progress (Jiang, Lepak, Hu, & Baer, 2012).

Generally human resource is understood as an integral part of systems that make up an organization. In another definition, human resource is the integrated capabilities of the intellect and physical power of an individual, and its behaviour is determined by heredity and environment, while his performance is motivated by a desire to meet his satisfaction (Hughes, 2006; Gardner, 2011).

Ulrich (2013) described that human resource as a source of strength and weaknesses in a firm. Human resources always refers to factors like skills, experience, and knowledge while organizational resources are factors like production/operations, purchasing/materials management, strategies, culture, marketing, finance, research and development. Physical resources include access to raw materials, technology, plant and equipment, geographic location and distribution network.

Oei (2010) discovered most human resources researches seeks to uncover factors related to employment, with studies of employees' job satisfaction, loyalty and teamwork, relationships with superiors and their style of leadership, relationship with subordinates, performance appraisal, and OC (Ding, Lu, Song, & Lu, 2012).

Several academics and practitioners had examined the relationship between HRC and OC. Human resources effects firm both directly and indirectly (Lev, 2001; Shapiro and Varian, 2013). A firm has a better chance to establish competitive advantage when its human resources competencies are difficult to be imitated by competitors, and this will enable the firm to achieve superior performance and remain competitive in the market (Porter, 1990; Ulrich, 2013). The following subtopic discusses human resource capability.

2.2.1 Human Resource Capability (HRC)

The impact of the HRC on OP and its involvement in developing business strategies are becoming increasingly important particularly in high-tech SMEs (Karami, 2004). Traditionally, people management is a key source for ensuring sustainable competitive advantage (Mabey et.al, 1998; Kakabadse et.al, 1998).

The four necessary prerequisites of competitive human resources are individual's capability and commitment (Analoui, 1998a); strategic importance of human resources (Kakabadse et al., 1998), management of human resources by specialists; and integration of human resource management in business strategy (Boxall, 1992).

Karami (2004) described HRC dimensions as skilled human resources, innovative human resources, human resources effectiveness, training competent human resources and human resources commitment. Wright et.al, (1998) also defined a skilled workforce as human resources capabilities. Analoui (1999b) defined managerial skills as task, people and self-development and analytical categories as human resources capability of firm.

Figure 2.1 illustrates the relationship between HRC on OP.

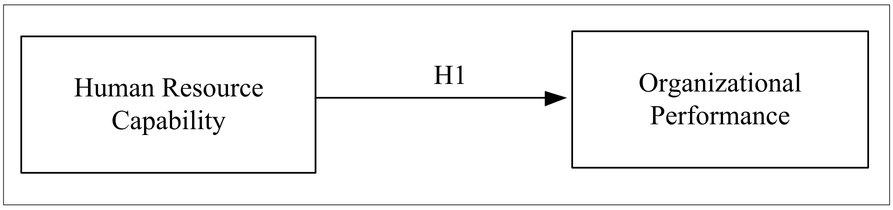

Figure 2.1
Human Resource Capability and Organizational Performance

The following subtopics discuss the component of HRC as described by Karami (2004).

2.2.1.1 Skilled Human Resource

Dale (2003) described behavioural aspects as skills that can be learned and improved through practice, and that can be used to meet the demands of a job. Usually, skills are acquired with effort and due learning process and the main feature of the skills is those aspects that are been learned (Koestler, 1983; Lovell, 1980). Brookfield 1994, Engestrom (1994) and Wood (1988) mentioned that trainers play an important role in training people by facilitating and guiding them in learning the process. Brookfield (1994) proposed a concept of facilitation which incorporates elements of challenge, confrontation and critical analysis of both self and society.

Analyses of Lovell's (1980) further strengthen the concept of skill and recognise it as a process. Moreover, most of the skills either they are mental, physical or social that been acquired with learning process shared some common features. Furthermore, skills can be acquired through a due learning process which can involve to organised and coordinate activities in order to achieve some goal, specific objective or for a specific event. This process can also involve activities such as ordering the things and coordinating various activities and processes in a temporal sequence to achieve specific objectives.

Wood (1988) regards expertise as a synonym of skills. Furthermore, he explained how our behaviour converges from everyday learning such as footballer and skilled tennis player etc. are examples of acquired skills. In psychological terms, skills consist of mental activities and detect some similarities between mental skills and physical activities. The both mental and physical skills involve time, self-control, error detection and organisation of activities.

Gardner (2011) refers to the skilled person or expert who possessed and masters in the skill related to particular domain or discipline irrespective of his age. This expert person must know the application of acquired knowledge in new situation appropriately. In relations to this, the theory of expertise emphasised on the level of performance and expert should demonstrate in his field. Moreover, the expert should also identify the development process through which a learner can able to achieve a certain level of expertise. There are four categories of skills, identified by Valley (1994) and de Corte (1990). According to them, a learner must acquire those to reach a certain level of expertise.

1. The ability and flexibility to apply the concepts, rules, principles and algorithms that make up a comprehensive knowledge base that is specific to a domain.
2. The ability to apply heuristic "rule-of-thumb" methods to problem-solving.

3. Metacognitive skills – the ability to self-monitor, reflect on and learn from experience, thus gaining knowledge about one's own cognitive functioning.
4. Strategies that a learner can use to acquire any of the first three.

Long-term learning policy of individuals consists of abilities to transfer of skills and competencies in the jobs. In the marketplace, Individual effectiveness, adaptability and flexibility are affected by the transferable skills (Kelly, 2001).

Mayo (2000) explained that the skills of human resources will improve the performance of a company through: 1) the ability possessed by someone from within himself, includes appearance, thoughts, actions, and feelings, 2) professional and technical know-how, the ability to be professional in every situation and condition, 3) or a person's competent in long enough experience in their field, and having an open attitude towards that experience. The following section discusses innovative human resource.

2.2.1.2 Innovative Human Resource

Amabile (2013) described how a firm may improve if employees are motivated, especially through good communication among them, and if they have the ability to create new ideas. These ideas will be a strong influence on the firm's operations (Aprillyani, 2006). In a good working environment, employees can perform their work better and this will increase productivity (Wibisono, 2011; Aprillyani, 2006; Amabile, 1997).

Creativity is as an innovation driven strategy that supports daily operations of a firm. In fact, creative ideas, always lead to innovations which may determine the survival or growth of a firm (Wibisono, 2011; Aprilyani 2006; Sternberg and Linda, 1997; Cumming and Oldham, 1997; Amabile, 2013). Strong support from top management is required in ensuring that creativity and innovation cultures exist and become a true and meaningful way for the firm to enhance its competitiveness (Amabile, 1997).

Cumming and Oldham (1997) suggested complex work tasks would lead employees to be more creative, enabling them to discover and develop:

a. New expertise and potential
b. New identification of overall work process
c. New standard of work procedures and work scheduled
d. New medium to get direct information regarding effectiveness of work
e. New impact on lives either within or outside of a firm.

Creativity and innovation also rely on creative support from colleagues, increasing their enthusiasm and engaging in healthy competition that finally lead to the development of new ideas and views (Cumming and Oldam, 1997). Hamel (1998) described five conditions to be met if a firm opts for an innovation strategy:

a. New Voices (new ideas) bring new insight and justification to the development of new strategy.
b. New Conversation: creating a platform for dialogue about strategies that cut across the entire firm and boundaries or obstacles of the industry which led to new

strategies and insights. Opportunities for innovation exist when competition is seen from multiple perspectives.

c. New Passion: Strong feelings for innovation among employees. A firm willing to invest when there is an opportunity to create something unique and interesting and above all able to generate.

d. New Perspective: a new way of seeing an industry, looking at consumers' needs from a new perspective. Managers should engage directly to be the intermediaries of such new insights.

e. New Experiment (new studies): new insight emerging from a broad-base strategy will never be perfect. Market research is needed as to minimize or avoid risk. Innovation refers to the use of ideas for solving a problem or exploiting a new opportunity.

Hamel (1998) described the following factors that transform the idea into innovation:

a. Information: information about respective innovation is perceived as very important.

b. Support: support is given by everyone who works close to the job that receives a direct impact from such innovation.

c. Resources: resources need to be allocated accordingly; to do this take money, time and materials to translate ideas into innovation.

Innovation strategy is the power to reconstitute the existing industry model and give new value for consumers, competitors, and shareholders (Hamel, 1998). A Fortune 100 survey defined innovation as the best blend of ideas, labour, product, and process in producing a new product of service (Timpe, 1999). Kotler and Keller (2012) described innovation as critical and imaginative ideas, a strategy to create a market in various places in the company.

Deshpande, Farley, & Webster (1993) explained that innovation in business emphasis on creating new products and services, using the accumulated knowledge of customers, competitors, and technology. Innovative human resources are people who can create new ideas and excellence of products by utilizing its resources for the company's benefit (Kotler and Keller, 2012; Christensen, 2010).

Innovation in every field depends on talent, the creativity of individuals trained and from their experience. No doubt innovation creates and introduces new ways of doing things or more strategic ways of using resource in meeting opportunity (Timpe, 1999). The following section discusses about effective human resource.

2.2.1.3 Effective Human Resource

Effective human resource is measures the ability to deliver result for every task assigned (Abduli, 2013). Drucker (2006) described effective human resource as not making things right, but finding the right things to do and then concentrating forces and tools to them.

Effective human resource focuses on action rather than on record-keeping, written procedures or rules (Drucker, 2006). It uses rules, records, and policies, but it stresses action. Effective human resource emphasizes on finding any employment-related problems to ensure firms are able to meet their objectives, and at the same time facilitating employee development and satisfaction (Drucker, 2006; Sims, 2002; Abduli, 2013).

Handoko (2005) described effective human resource as measured through their ability to act in accordance to the plan, and able to achieve objectives as assigned. Campbell (2000), Steers (1985), and Noruzi (2010) on the attributes of an effective workforce:

1. Preparedness: a worker is always ready to complete worker any assigned task.
2. Absenteeism: a worker has very low frequency of absent from work.
3. Morale: a worker has high morale to achieve goals and objectives.
4. Motivation: a worker has strong motivation and enthusiasm to get job done.
5. Job satisfaction: a worker indicates a strong degree of satisfaction on every job assigned or done.
6. Work expenses: a worker knows its strength and delivers the task accordingly.
7. Time completing tasks: a worker knows how to deliver a task within a given time-frame.

The following sub topic discusses training competent human resource.

2.2.1.4 Training Competent Human Resource

From the human resource point of view, the outcome of training must come in the form of more productivity of employees, linkage of the knowledge from training with the work design, and improvement of required skills and attitude (Xiao, 1996). Hence, the concept of training involves many key ideas, such as being a continuous process, an organizational incident involving both management and employee, and an organization responsibility. Training is an organizationally planned and systematic activity which aims to change or enhance the employee's knowledge, skills, and attitude (KSA) within the organization.

Clemenz and Weaver (2003) defined training as the acquisition of skills or attitudes that result in improved performance in an on-the-job environment. Noe and Schmitt (1986), and Noe (2011) defined it as a planned learning experience designed to bring about permanent change in an individual's knowledge, attitudes or skills.

Noe (2010) found that a human resources department needs to define certain strategies to resolve issues concerning improvement of staff performance; for instance, the generation issue, the every person has fundamental beliefs and values. Such differences should be kept in consideration when hiring people. Differences due to job positions, responsibilities, features, tasks, knowledge, and skills require special training (Hayes and Ninemeier, 2009).

Some organizations opt for staff reduction in order to improve operating efficiency (Hayes and Ninemeier, 2009), but one of the main consequences of downsizing is the loss of knowledgeable and skill full people; for this reason, training of the remaining staff becomes imperative if performance is to remain at the desired level (Noe, 2010).

Training is one of the most important investments an organization can make, no matter what the business or industry (Kirkpatrick and Kirkpatrick, 2009). A systematic training approach is important for human resource development, and a good training program requires clear training objectives, training methods, and evaluation.

The following subtopic discusses human resource commitment.

2.2.1.5 Human Resource Commitment

Steers and Porter (1987) defines human resource commitment as employees' commitment to the organization. Organizational commitment is more than a formal relationship, but covers attitude, willingness to work hard, and loyalty to the organization.

Miner (1992) described commitment as the strength of an individual in supporting an organizational agenda. Organizational commitment is characterized by three things: acceptance of the organization's values and goals, readiness and willingness to strive earnestly, and desire to maintain membership with an organization. Meyer and Allen (1997) stated that employees who are committed to an organization will work dedicatedly, and it should be more than passive loyalty.

Steers (1985) suggested that employee commitment to the organization has three main components: identification, engagement and loyalty to the organization or its employees.

a. Identification is a conviction and acceptance of a set of values and goals of the organization. This dimension reflects the assimilation of the employee's values and goals with organizations. A good working atmosphere would enhance an employee's willingness to work hard in achieving organizational objectives because he believes that the organization is equally prepared to meet their personal goals.

b. Engagement is a strong desire to strive for the sake of the organization. This is reflected in the efforts of employees to accept and carry out any duties and obligations imposed on them. Employees not merely perform duties, but always strive to exceed the minimum standards set by the organization.

c. Employee loyalty means willingness to perpetuate a relationship with the organization. If necessary the employee is even willing to sacrifice his personal interests to organization achieving its objectives.

The following subsection discusses the relationship between HRC and organizational performance.

2.2.2 Relationship between HRC and OP

Studies on human resources that are associated with OP have produced mix results since 1980s. Some found no relationship between human resource planning and financial performance (Mahadeo, Soobaroyen, & Hanuman, 2012; Purce, 2014), although another set of studies a significant relationship between human capital and OP. Optimal resource utilization can increase the productivity of the company (Porter and Kramer, 2011; Rolstadas, 2012), and human resources generally have positive relationship with OP (Clarke, Seng, & Whiting, 2011; Maditinos, Chatzoudes, Tsairidis, & Theriou, 2011; Rosenbusch, Brinckmann, & Müller, 2013).

Competitive human resource can have a strong relationship with productivity and financial performance (Patel, Messersmith, & Lepak, 2013; Purce, 2014), and human resource as intellectual capital has a significantly positively relationship with performance of a company (Komnenic and Pokrajcic, 2012). The efficacy of human resource is an organizational-level efficacy that attracts human talent as well as enhancing employees' level of motivation. Furthermore, HRC plus unique cultural traits can be an organization a competitive advantage. This means human resources are crucial in generating better OP (Enkel, Roseno & Mezger, 2012).

The following subtopic discusses the relationship between HRC and organizational culture.

2.2.3 Relationship between HRC and OC

An OC encouraged by management will lead to a successful organization, and it can be significantly influenced by human resource practices. The attitude of top management in understanding the importance of the human resource has a significant impact on the organization's success (Phillips, 1996). In the era of globalization, various human resource management practices have been adopted and progressively boost a company's performance or competitiveness (Zhu, Chew & Spangler, 2005).

According to Ngo and Loi (2008), OC is more related to the behaviour of employees and human resource practices than employees' skills. They also found that cultural adaptation has a direct impact on the performance of human resource-related and indirect impact on performance in relation to the market as mediated by the human resource-related performance (Ngo and Loi, 2008).

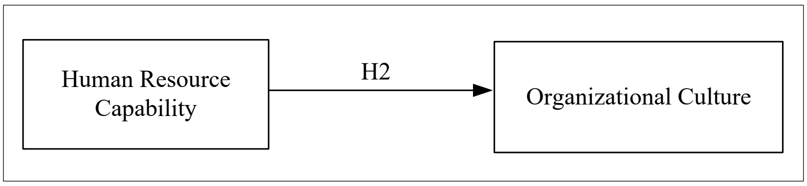

Figure 2.2
Human Resource Capability and Organizational Culture

Besides HRC, this study also investigated another strategic factor known as PPS.

2.3 Production Planning System (PPS)

The PPS is a component of production management or operations management, which aims to produce goods and services of right quality and quantity at the right time and cost (Heizer and Render, 2011; Jarkas and Blitar, 2012; Sarjono, 2014). PPS transform inputs into finished good or outputs that enable the organization to achieve its objective (Schank and Abelson, 2013; Simons, 2013).

Simons (2013) described the scope of operations management under three main aspects; 1) A PPS that consists of product planning, location factory planning, factory layout planning, workplace planning, and planning production standards; 2) Production system control, that control of the production process, materials, labour, cost, quality and maintenance, and; 3) Production system information that consist of organizational structure, productions mad to from stock and productions made to order. Figure 2.3 illustrates the scope of operation and production management.

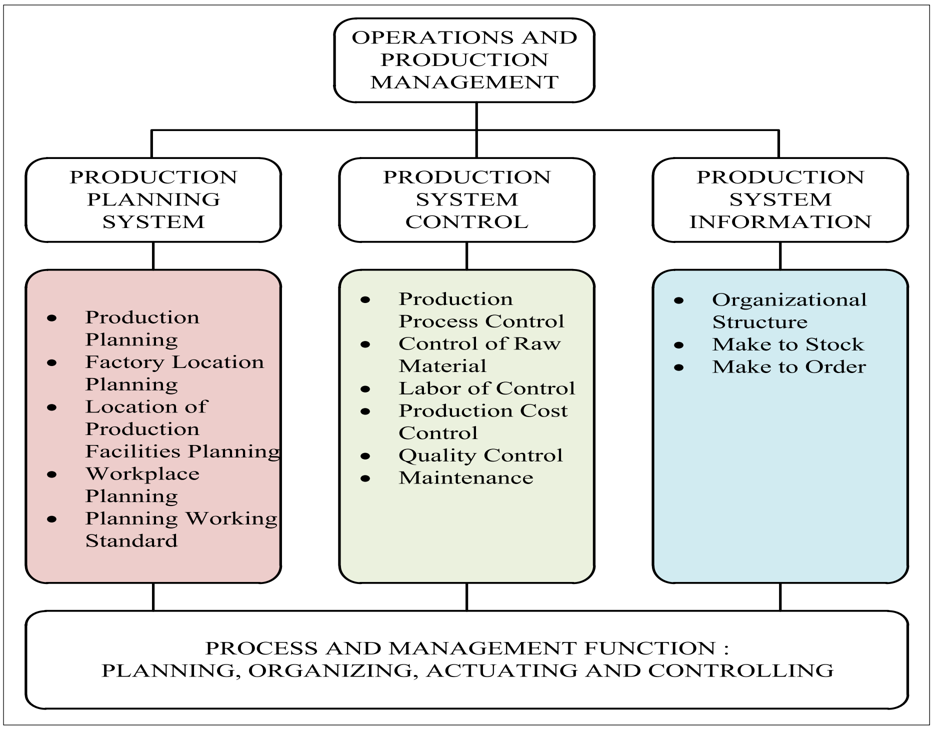

Figure 2.3
Scope of Operations and Production Management
Source: (Chary, 2000; Schroder, 2011)

Production management is an activity whereby resources flowing within a defined system are combined and transformed in a controlled manner to add value in accordance with the policies communicated by management (Cummings and Worley, 2014; Drees and Kummer, 2013).

Heizer and Render (2011) describe has four characteristics of production systems:

1. It is an organized activity, with an objective.
2. It transforms various inputs to useful outputs.
3. It does not operate in isolation from the other organization system.
4. It emphasizes the importance of feedback about activities, essential to controlling and improving system performance.

Production of any commodity or service is the volume of output irrespective of the quantity of resources employed to achieve the level of output. Production in an industry can be increased by employing more labour, installing more machinery, or putting in more materials (Heizer and Render, 2011; Kristal, 2013).

However, the increase in production does not necessarily mean an increase in productivity. Higher productivity will be obtained when a firm blends efficiency of using resources into the production system. For example, a combination of factors such as materials, machinery, capital, and labour will produce output in industry, but it is important to have good PPS to ensure or enhance OP and competitiveness (Heizer and Render, 2011; Rolstadas, 2012). Figure 2.4 illustrates the components of a PPS.

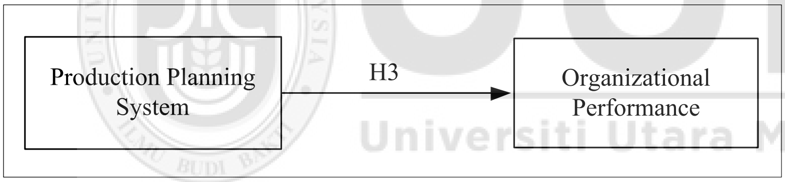

Figure 2.4
Production Planning System and Organizational Performance
Source: (Chary, 2000; Schroder, 2011)

2.3.1 Production Planning

Product planning and control of should include of both manufacturing and remanufacturing activities within a closed-loop network (Kenne, Dejax, & Gharbi, 2012).

Erdirik-Dogan and Grossmann (2007) stated the objective of production planning in terms of high-level decisions like product inventories and production levels for a given market and long term demands ranging from months to year to determine the capacity of production. Typically, planning models are used for the prediction of material flows and production targets.

Overly optimistic production targets and over-estimation of available production capacity will jeopardize the planning effectiveness, which is why it is necessary to use an appropriate approach or model to ensure best production planning (Kenne, Dejax, & Gharbi, 2012). The following sub-section discussed facilities layout.

2.3.2 Facilities Layout

Productivity maximization is among the main objectives of manufacturing system. Several factors, including the complexity of the developed product, type of product, quality of raw materials and arrangement of workstations, which constitute the process of production and complexity of the manufacturing process, effect productivity (De Carlo, Arleo, Tucci, & Borgia, 2013).

The facility layout problem (Numan, 2010, 2005b; Kusiak and Heragu, 1987) is everything concerning arrangement that a firm many face in executing its production activity. In fact, a facility is the manifestation of execution activities at any level, whether section, division or the entire plant (De Carlo, Arleo, Tucci, & Borgia, 2013; Heragu, 2006).

Transportation is one of the factors strongly associated with facility layout (Francis, McGinnis, & White, 1992). A number of studies show about 20-25% of manufacturing costs are related to activities of material handling, but the cost can be reduced by 10-30% annually if the facility planning is efficient. Furthermore, good facility layout planning improve the throughput times (TT) and work in progress (WIP) of specific tasks (Askin and Standrige, 1993). The following sub-section discusses factory location planning.

2.3.2.1 Factory Location Planning

The factory location planning is an important component of PPS (Davenport and Beck, 2013; Numan, 2010). Eight factors to consider in determining the location are: 1) location of the market, especially for service-based firms; 2) access to raw materials, especially for manufacturing companies, which are generally established close to the raw material-based firms; 3) labour availability, especially for labour-intensive firms; 4) community acceptance, especially for business; 5) government support in facilitating business and industry; 6) availability of infrastructure: electricity, water, telephone and other supports facilities; 7) accessibility of transportation, especially for raw materials and goods; and 8) supporting infrastructure such as adequate parking space, waste disposal, safety, and healthcare facilities (Horváth and Harazin, 2015). The following sub-section discusses location of production facilities planning.

2.3.2.2 Location of Production Facilities Planning

Production facility planning refers to setting up facilities in manufacturing plant. It should be strategic, so as to ensure all equipment is stationed with the ultimate objective of ensuring smooth production process (Duflou, Sutherland, Dornfeld, Herrmann, Jeswiet, Kara, Hausschild, & Kellens, 2012).

Production facility planning is described as the activity of analysing, conceptualizing, designing and implementing a system for the manufacture of goods or services. The design itself is generally referred to as the floor plan, the arrangement of physical facilities (equipment, land, buildings, etc.) and is guided by production targets and objectives (Manganelli, 2013; Apple, 1993; Tomkins and White, 1984). The following sub-section discusses about work design system.

2.3.3 Work Design System

The work design system is considered as a well-organized set of common directions supporting the execution of specific task. The individual or groups doing the work must be involve in the design process (Alter, 2013).

Hahn and Kuhn (2012), described manufacturing system design as costly. The uncertainty of factors like part demands and processing times make the decision complex. In order to meet specific objectives under these uncertainties, designers always look for robust manufacturing system design. Without robust design would lead to high production costs and decline of sales. Designers must ensure accurate procedures for modelling different uncertainties and efficient ways of finding the best configuration. The following sub-section discusses about workplace planning.

2.3.3.1 Workplace Planning

The smallest unit of production activity in manufacturing industry is workplace or work station. A station might have one operator, one machine, a desk, raw material, shelves for tools, material handling equipment and space for an operator to complete his task. At this stage, there is interaction between humans, machines and other working equipment (Nah and Kim, 2013).

Effective workplaces must be planned and designed so that people can safely and effectively perform the required tasks. Reach, size, muscle strength, and visual capabilities have to be considered. Although reach can be extended by stretching or leaning, and muscle strength increased by provision of tools or other aids, planning and designing the workplace to fit most people's capabilities helps to reduce unnecessary job stress and increase productivity of work (Kossek, Hammer, Kelly, & Moen, 2014).

Watkins, Kaufman, & Odunlami (2013) described workforce planning is a continual process used to align needs and priorities of the organization with those of its workforce, to ensure it meet its legislative, regulatory, service and production requirements and organizational objectives. Workforce planning is closely associated with workforce development strategies.

Workforce planning comprises filling a request for resources, analysing the use of resources, forecasts capacity, identifying and managing resources (Fetcho-Phillips, 2011).

In planning the work, it is necessary to consider the adjustment between the worker, the work process and work environment, and this approach is known as ergonomics (Pheasant and Haslegrave, 2005). Ergonomics is science and its application seeks to harmonize between people, work and environment to highest degree of efficiency and productivity (Nafukho, Graham, & Muyia, 2010). The following sub-section discusses working standards planning.

2.3.3.2 Planning Working Standard

Working standards planning is important in operations management especially in the context of productivity and job satisfaction. A good working standards system is needed in building high performance and pleasant work atmosphere. It considers the working environment so as to create a sense of security, health and accident prevention (Black, 2008).

The design of a working standards system requires attention from both management, and employees, because the procedures, working conditions, and time standards set should be realistic and able to be implemented by employees under normal condition (Sammito and Niebel, 2013). Sammito and Niebel (2013) described two important elements in the design:

a) Job design

   Job design relates to the content and method of implementation of tasks and work activities, based on questions such as who works on the task, how the task is performed, the order in which tasks are done, and what results to expect.

b) Work measurement

   Work measurement is related to determining standard time that is the time needed by a trained worker to complete a task, work at a sustainable rate, and using methods, machinery equipment, materials, and arrangements at a particular workplace for the specific task assigned.

The following sub-section discusses the relationship between PPS and OP.

2.3.4 Relationship between PPS and OP

There are various models for the process of production. A poor planning system may lead to machine breakdown, which will increase operating cost and decrease competitiveness (Severo, de Guimarães, Dorion, & Nodari, 2015).

A layout that facilitates flow from one work station to another contributes to competitiveness, as does the location of specific stations in strategic areas. Such management would improve the production system (De Carlo Arleo & Tucci, 2014).

Joseph and Gaba (2014), described how a production system can benefit both productivity and the drive for economies of scale. Enlargement of a single operating unit enables the company to achieve economies of scale, reducing the cost per unit of production. For multi-unit organizations, a unique source of advantage is represented by economies of production.

The pursuit of production capacity optimization as to establish competitive advantage has intensified the demand for higher product development speed, manufacturing flexibility, waste elimination, better process control, efficient manpower utilization and global reach (Duffy, 2011; Hadid and Afshin, 2014; Marodin and Saurin, 2015).

Such requirements have led firms to opt for the lean philosophy originating from TPS (Toyota Production System), that streamlined the production process to ensure efficiency in all aspect of production activities (Schönberger, Ponsford, Olver, Ponsford, & Wirtz, 2011; Smart, Womack, Flensburg, Keller, Paciorek, Sharff, Vornhein, & Bricogne, 2012).

This manufacturing philosophy, if carefully implemented, can undoubtedly form a roadmap to global manufacturing excellence (Marodin et al., 2015). The core thrust of lean manufacturing is to create a streamlined at high-quality system that produces finished products at the pace of customer demand with little or no waste (Ghosh, 2012).

One of the strategic approaches to meeting the challenges of a competitive environment is enhancing manufacturing capability (Hashim, Habidin, Conding, Zubir, & Jaya, 2013). Therefore, maintenance production facility must be considered as a strategic issue good manufacturing facility would enhance quality, productivity and profit (Al Najjar, 2014; Shan, 2012).

The following sub-section discusses the relationship between PPS and OC.

2.3.5 Relationship between PPS and OC

OC describes ways of working, including stories, traditions and belief systems that members of the organization share, which is acceptable to achieve objectives (Calories and Sarnin, 1991; Hofstede, 2001; Schein, 2010). Culture is cumulative, as people share their experiences over time, dealing with their social and physical environment and adapting to the same conditions (Hofstede, 2001).

According to Quinn and Spreitzer (1991), most of the research on OC has focused on understanding and definition, but to support management objectives, the impact of OC should be examined. In this study, the hypothesis concerns the relationship between PPS and OC.

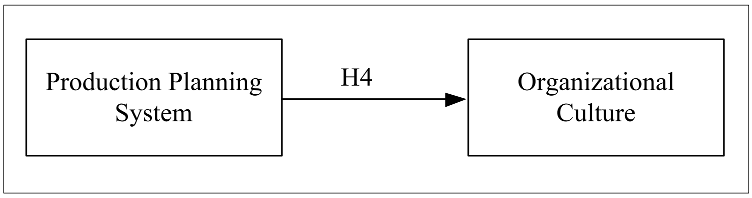

Figure 2.5
Production Planning System and Organizational Culture

Beside PPS, this study investigates another important factor to form competitive firm that is technology. The following sub-section discusses this factor.

2.4 Technology

Technology is a crucial in contemporary socio-economic development, and it can be a key to a prosperous society and successful nation (Al-Najjar, 2014). Technology represents man's capacity to harness nature to his productive efforts. Once considered an inexplicable residual, technology is now accepted as the engine for growth (Al-Najjar, 2014).

Numan (2005a) distinguished between high technology and low technology, which are also seen as modern and traditional technology, and capital-intensive labour-intensive technology. Technology is a combination of physical equipment and all the knowledge relating to the manufacture or use of these tools.

Numan (2005a) devided technology into four components:

1. Technoware (T) = object-embodied technology = physical facility. It includes all physical facilities necessary for operation transformation such as instruments, equipment, machinery, devices, structures and factories.
2. Human ware (H) = person-embodied technology abilities = human resource capabilities: knowledge, skills/expertise, wisdom, creativity, achievement, and experience of a person or group of people in utilizing natural resources and available technological resources.
3. Info ware (I) = document-embodied technology = documented facts = device information related to processes, procedures, techniques, methods, theories, specifications, designs, observations, manuals, and other facts that are disclosed through publications, documents and blueprints.
4. Organ ware (O) = institution-embodied technology = organizational framework = device organization/institution: the facility required to contain physical equipment, human capacity and facts, which consists of management practices, linkages, and organizational arrangements for achieving positive results.

The above four components are minimum requirement that must be met in order to ensure the application can run effectively.

Minimum requirements for each component are Numan (2005a):

- T requires an operator with a certain level of capability.
- H is techno ware operation, which has to be developed gradually.
- I requires renewal of the facts on a regular basis.

- O must be continuously developed to meet the changes inside and outside the activities of transformation.

These are represented in Figure 2.6.

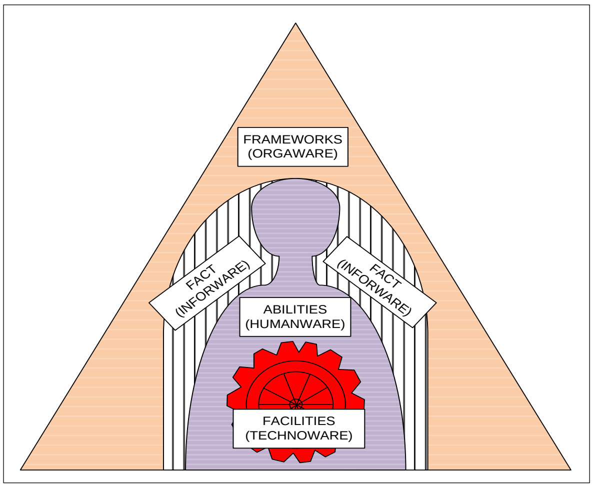

Figure 2.6
Technology Component
Sources: Numan *(2005a)*

When the activities are still performed manually, it is hard for a firm to reach its true potential, and the best answer for manual and labour-intensive production is high technology. With appropriate technology a firm has a better chance of securing better OP and competitive advantage (Numan, 2005a). Figure 2.7 illustrates the model that link technology with OP.

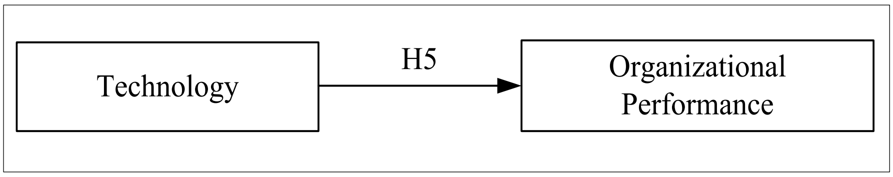

Figure 2.7
Technology and Organizational Performance

2.4.1 Technical Science

Technical science contributes to increase of productivity, efficiency OP and greater competitiveness (Loydell, 2012). For example, a new technology, Radio Frequency Identification (RFID), has been introduced and can be used for many applications from inventory tracking to building access. This technology has great promise for diversified use in many industries with numerous practical applications (Zhu, Mukhopadhyay & Kurata, 2012).

Firms always look for technology that is appropriate to support their specific business objectives. Appropriate technology must be able to help them reduce cost, be easy to maintain, and produce minimum negative impact such as pollution (air, water, noise etc.) (Cohen-Gilbert, Killgore, White, Schwab, Crowley, Covell, Sneider & Silveri, 2014).

In today's era of competition, especially for technically unsophisticated products production would benefit from technically advanced machinery with technically competent operator with high level of technical skill (Floreani, 2014). The following sub-section discusses level of skill.

2.4.2 Level of Skill

In production system, employees should be well informed about their role in supporting the organization in terms of social, technical and environmental obligations. They are encouraged to be assertive and learn multiple skills so that they can perform multiple tasks in the future (Chaplin, Kjeldsen, Christensen-Dalsgaard, Bedding, Gillialand, Kawaler, Appourchaux, Elsworth, Garcia, Houdek, Karoff, Metcalfe, Molenda-Zakowicz, Monteiro, Thompson, Verner, Batalha, Borucki, Brown, Bryson, Cristiansen, Clarke, Jenkins, Klaus, Koch, An, Ballot, Basu, Benomar, Bonanno, Broomhall, Campante, Corsaro, Creevey, Esch, Gai, Gaulme, Hale, Handberg, Hekker, Huber, Mathur, Mosser, New, Pinsonneault, Pricopi, Quirion, Regulo, Roxburgh, Salabert, Stello, & Suran, 2011; Dennis and Dowswell, 2013). Most importantly, employees are empowered to make design and process changes if this leads to product and process improvements respectively (Netland, 2013).

Adler (2012) warned that formal work standards developed and imposed by industrial engineers on workers may be alienating. However, procedures that are designed by workers themselves better productivity, quality, skills, or understanding.

Multi-functionality refers to workers' skills in performing multiple tasks within a given unit (Skager, 2014). Organizations in fast-changing markets need product and process flexibility and a multi-functionally workforce (Fetcho-Phillips, 2011; Tun, Smithuis, London, Drew & Heiden 2014). 'Mechanistic' organizations can achieve flexibility by hiring specialists and experts, while 'organic' organizations achieve it through training employees to be multi-tasking (Skager, 2014).

The quality of work will be enhanced if employees can influence decisions that affecting their jobs. In addition, employee competence enhances productivity and OP (Bowker, Markovic, Cogswell & Raja, 2012). The following sub-sections discus the element of physical tools.

2.4.3 Physical Tools

Physical tools in the technology triangle comprise equipment such as materials, machines, hardware, procedures and physical facilities owned and used by every manufacturing company. A good plan involving types of tools to use and well-trained human resources enable the firm to convert raw materials into finished goods.

Application of technology in the manufacturing sector involves not only implementation, but also the impact of such technology, especially on the environment. Every firm needs equipment to produce good-quality products and achieve targeted OP, and appropriate manufacturing technology helps the company in this (Bowker et.al., 2012).

Pusparini and Wibisono (2013) described the age and condition of a technology as effecting a firm's ability to execute its production strategy. New technology is usually more efficient and effective than old technology. Therefore, investment in advanced technology to improve production capacity and efficiency is highly recommended especially for firms that intend to use production capacity as a competitive advantage (Pusparini and Wibisono, 2013). The following sub-section discusses the relationship between technology and OP.

2.4.4 Relationship between Technology and OP

Strong competition had driven firm to manage their resources including technology strategically. The always strive to improve skills, productivity, quality and finally OP (Zhu, You, Schönsleben, & Alard, 2011). Taylor and Collaboration (2012) described globalization as changing the level of competition in interesting ways.

Advances in technology not only enable large firm to compete but also SMEs in the face of rapid technology changes in the manufacturing sector. In other words, Advanced Manufacturing Technology (AMT) enables all sizes of firm to compete successfully and secure their respective objectives and OP measures (Wambui, 2014). Dynamic firms enhance their efficacies for innovation as a means of staying current in their field (Wambui, 2014).

Firms using advance technology need continuous technological upgrades in order to remain competitive (Taylor and Collaboration, 2012). They address customer satisfaction through the latest technology and at the same time achieve their intended OP. In other words, the latest technology improves operating practice, and the quality and quantity of goods and services (Dauda and Akingbade, 2011).

Dauda and Akingbade (2011) believe that systematic application of physical forces with the help of different types of technology and innovation influences the production of goods, and services, and OP. In many organizations, technology provides the needed force if different ways by which goods and services are produced are to be implemented. Dauda and Akingbade (2011) continued that this might be in the form of machines, communication, equipment and information, which is made up of methods, knowledge, tools and systems, directed to work in a specific way.

After analysing the business environment, small-scale industries must focus on the development of effective strategies (Siswanto and Fathoni, 2015). Markets are more competitive in this changing environment especially in sectors requiring a high level of product quality, priced competitively. Firm will re-organize their work process to respond to these changes by adapting strategies that are strongly customer oriented.

Many firms have invested in AMT such as computer-integrated manufacturing (Baines and Langfield-Smith, 2003), which results in improvement of quality, flexibility and productivity as well as cost reduction (Amah and Ahiauzu, 2014).

Baldwin and Yan (2012), found plants with technologically advanced equipment are more productive and record superior performance. This study will analyse the influence of technology on OP.

The following subs-section discusses the relationship between technology and OC.

2.4.5 Relationship between Technology and OC

According to Norhani (2008), technological advances are anchored by the practice of a nation and the values that shape the culture of the technology concerned. Cultural knowledge and learning, research and innovative practices must be implemented to strengthen the knowledge and achievements in the field of technology to remain competitive.

Norhani and Rugayah (2002) and Anandarajan, Igbaria, & Anakwe (2000) suggest that the use of technology has strong cultural component. Human behaviour in using technology is dependent on and influenced by cultural values, culture being a social force that allows humans to act.

According to Norhani (2008), culture as a response to human needs; humans perform various activities, using equipment and specific ways to achieve these needs. Technology is applied to individual or group practices that respond to their needs, and the diversity found in technology illustrates the difference environments, needs and abilities of people, closely related to their culture.

Technology provides resources which people can use and thus increase the impact on the task being performed (Jaafar, 1997). This study analyses the influence of technology on OC.

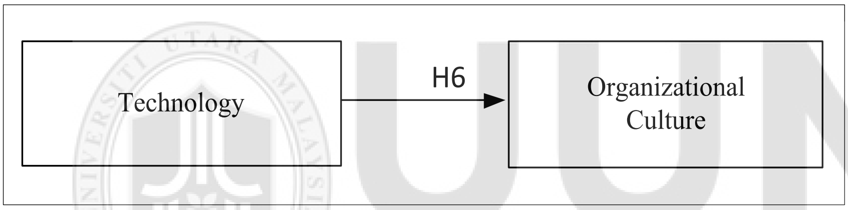

Figure 2.8
Technology and Organizational Culture

The following section discusses OC as a mediating variable in the context of this study.

2.5 Organizational Culture (OC)

OC is the "underlying values, beliefs, and principles that serve as foundation for an organizations as well as a set of management practices and behaviours that both exemplify and reinforce those basic principles" (Amah and Ahiauzu, 2014).

Culture is a critical factor for every organization (Schein, 2004), and an appropriate culture can improve its performance (Steers, 1985; Stoner and Wankel, 1996). Corporate culture is often defined as values that are understood and adhered to by all the staff, making them feel like a family and using it as a catalyst to achieve and the firm's objectives (Stoner and Wankel, 1996).

Stoner and Wankel (1996) also suggested that culture is a complex combination of assumptions, behaviours, stories, myths, metaphors and various other ideas that became one, to determine what it means to be members of a particular community. OC include a numbers of important insights, such as norms, attitudes, and beliefs, shared by members of an organization (Stoner and Wankel, 1996).

Kotter and Heskett (1992), described culture as having a strong impact on OP. Specifically, corporate culture has the following characteristics:

1. It can have a significant impact on firm's economic performance.
2. It may even be the most important factor in determining the success or failure of a firm.
3. It is not uncommon to inhibit solid financial performance.
4. It can affect OP.

In the field of strategic management, the role of OC in creating competitive advantage has been studied by many researchers. Barney and Ouchi (2015) asserted that OC is a valuable, rare, and imperfectly imitable resources, which is a source of sustainable competitive advantage.

OC has two facets: culture as a variable or as a metaphor (Piaget, 2013). It stems from social interaction among members of an organizations, further interacting with other variables such as technology and structure (Unger-Aviram & Erez, 2015).

Many researchers have confirmed that OC effects OP (Sokro, 2012; Racelis, 2010; Fard, Rostamy & Taghiloo, 2009; Mathew, 2007; Rose, Kumar & Abdullah, 2008). It has an impact on employee motivation which, in turn, affects organizational productivity and performance (Mathew, 2007; Sokro, 2012; Trivellas and Dargenidou, 2009). OC is positively related to organizational activities and performance. OC also mediates the relationship between HRC, PPS and technology (Simons, 2013; Sokro, 2012; Trivellas and Dargenidou, 2009; Karami, 2004). From the above discussion, it is apparent that OC is important in improving OP. Therefore, the following hypotheses is formulated:

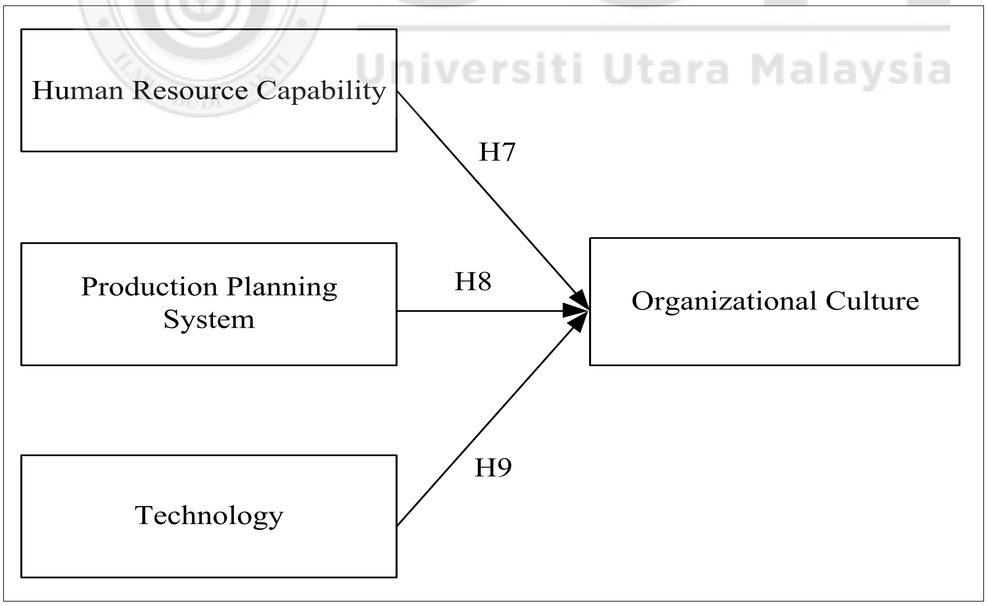

Figure 2.9
Organizational Culture Mediating Effect between Human Resource Capability, Production Planning System and Technology

The following section discusses OP as dependent variable in this study.

2.6 Organizational Performance (OP)

Various researchers, authors, academics have offered different meaning for OP. Among them are firm's performance, organizational performance, new venture performance, financial performance, and non-financial performance.

Performance management is critical for all firms. Performance refers to achievement of objectives and how they are managed, and is reflected in the success of firms through growth and better productivity levels. Performance measures are challenging due to multi-dimensional constructs or conclusive measurement (Lechner and Gudmundsson, 2014).

Murphy and Pazzani (2014) described performance measurement as important as it indicates the success or failure of a venture or business. Meanwhile, Allred, Fawcett, Wallin & Magnan, (2011) argue that key financial performance for small firms should cover growth indicator, profitability and cash flow. The following sub-section discusses performance measurement.

2.6.1 Performance Measurement

Susilawati, Tan, Bell, & Sarwar (2013) differentiated between two stages of performance measurement as described in the literature. The first stage is set between the 1880s and the 1980s and emphasizes financial measures such as profit, return on investment and productivity. The second stage starts in the 1980s, and emphasizes both financial and non-financial measures. Examples of non-financial measures are technologies, plant productive capacity, customer satisfaction, delivery times and development time of new products. Over the last ten years many authors have suggested that performance measurement should comprise both financial and non-financial measurement tests (Yu, Wee, Yang & Wu, 2014). In other words, it is dangerous to focus solely on costs because such performance assessment might lead managers to ignore other strategic objectives (Hitt, Ireland, Sirmon & Trahms, 2011). The following sub-section discusses financial and non-financial performance.

2.6.2 Financial and Non-Financial Performance

More and more studies have revealed the advisability of supplementing conventional financial indicators with other indicators, that is non-financial ones which are better suited to measuring performance on the basis of firms competitive priorities (Subramony and Stetz, 2014). Firms will consider intangible factors when they realize the importance of technologies, plant productive capacity, customer satisfaction, delivery times, development of new product and ability to reflect market characteristics over the long term (Schoot, Kaplan, Denissen, Asendorf, Neyer, & Aken, 2014).

However, it is virtually impossible to provide a generic list of measures which can be applied to all manufacturing firms or, at the very least, to all the firms in the same sector (Suriyankietkaew and Avery, 2014). Therefore, there are cases where financial indicators alone are applied (Barney, Ketchen, & Wright, 2011), while in other situations great emphasis is put on incorporating other indicators (Klein, Wallis, & Cooke, 2013).

The choice of a given measurement criterion should in itself be a reflection of the management's strategic goals (Leong and Ward, 2011). This means that performance measurement should serve both for drawing up strategy and for knowing what the strategy entails, and a good measurement system reflects the competitive priorities of a business unit (Cao, Zhao, Yang, & Xiong, 2015).

The literature clearly indicates some relevant characteristics of performance measures and measurement systems. All those suggested are centred either on financial and non-financial or integrating both inputs; for example, they must meet the needs of specific situations in relevant manufacturing operations and should be long-term oriented, as well as simple to understand and implement (Vaidya and Chitnis, 2012); and they must align financial and non-financial measures and be used within a strategic context (Watts and McNair-Connolly, 2012). Measures must change dynamically with strategy (de Lima, da Costa, Angelis, & Munik, 2013), must reflect relevant non-financial information, based on the key success factors of each organization, and must be clearly defined and have an explicit purpose (Watts and McNair-Connolly,, 2012).

The study uses the performance measurements developed by Kaplan and Norton (1996), specifically both financial and non-financial measurements are used in strategic performance (Johari, Yean, Adnan, Yahya, & Ahmad, 2012). The dimensions representing firm performance of this study from financial and strategic attributes are: (1) return on sales (ROS), (2) return on investment (ROI), (3) market share, (4) sales growth rate, (5) innovation and learning perspective, (6) customer perspective, and (7) internal business perspective. Therefore, the following hypothesis is formulated:

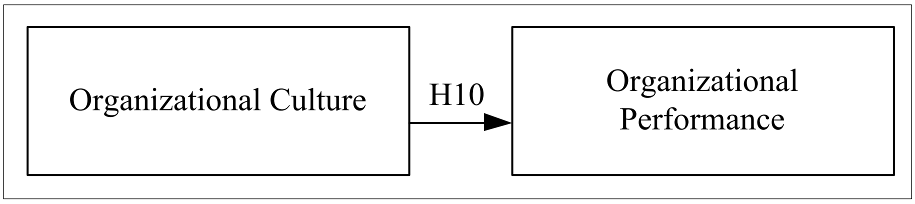

Figure 2.10
Organizational Culture and Organizational Performance

2.7 Underpinning Theory

Over the years, various theories have been used in discussing the relationship between strategy, structure and performance. Among them are Resource-Based View (RBV) and Dynamic Capabilities (DC). RBV in one of the most frequently used theory in studies related to the use of resources and performance (Barney, 1991; Grant, 1996), as the accumulation of resources is important in influencing the success of a business.

2.7.1 Resource Based View (RBV)

Barney et al. (2011) described the RBV of a firm as referring to its own resources, enabling them it to achieve competitive advantage and leading to its long-term performance. Competitive advantage is created with the help of resources that are rare and valuable, but firms must protect themselves against imitation of resources, substitution or transfer. Generally, RBV theory is supported by empirical studies using theory. Resources play a fundamental role in determining OP in competitive environments (Hitt et al., 2011). In this context, RBV has been proven to support firm that emphasize resources as a basis for competition (Barney et al., 2011).

RBV emphasizes the importance of all managers to create value from within the organization. This enable the firm to establish sustainable competitive advantages based on unique and valuable resources, toward superior performance (Liang, You & Liu, 2010).

This research proposed a research framework in line with RBV, by identifying the effects of HRC, PPS, technology and OC on OP (Hajmohammad, Vachon, Klassen & Gavronski, 2013).

Some studies had made the distinction between resources and capabilities (Allred, Fawcett, Wallin, & Magnan, 2011), the former being tradable and non-specific to the firm, and the latter firm-specific and including transfer of knowledge within the firm (Allred, Fawcett, Wallin, & Magnan, 2011). This distinction has been adopted throughout the RBV literature (Barney et al., 2011).

Therefore, firms may gain competitive advantage based on the creative potential of staff to develop differentiated products for niche market (Terziovski and Guerrero, 2014), while innovation is assumed to be the only way for them to make such differentiation in their production process. Some empirical studies of OP adopted RBV and cited differences not only between firms within the same industry (Terziovski and Guerrero, 2014) but also within the narrower confines of groups among industries.

In RBV, resources are considered personnel based, tangible and intangible. Financial reserves are included in tangible resources as are physical resources like stocks of raw materials and plant. Technology, reputation and human resources are counted in intangible resources, and so are commitment, loyalty, culture, training and employees' expertise. As these resources are not considered productive on their own, the analysis needs to consider the efficacy of an organization in managing, integrating and assembling these bundles of resources.

In this study, combination of the following resources and capabilities are considered: 1) HRC; 2) PPS; 3) technology; and 4) OC; they are used as to identify their effect on OP. The following sub-section discusses about dynamic capabilities that is another important theory for firms that uses resources as their basis of competition.

2.7.2 Dynamic Capabilities

Teece (2013) described DC as extensions to RBV. They consider all aspects of the environment, and firms that opt for this theory will be able to make strategic changes in accordance with changes that occur internally or externally (Teece, 2013). In other words, this theory enables firms to develop a competitive advantage even in a rapidly change environment (Teece, 2013).

A firm's ability to gain a valuable market position is explained by firm-specific resources and capabilities (Kuivalainen and Taalikka, 2013). DC enable them to create new capabilities through a combination of resource and capability that finally lead to establishment of a sustainable competitive advantage, even under the conditions of market and technological change (Teece, 2013). Specifically, DC answer the fundamental question, why some firms are successful in dynamic competitive environment and others fail (Ambec, Cohen, Elgie, & Lanoie, 2013).

2.8 Summary

This chapter reviews literatures related to HRC, PPS, technology, OC and OP. In conclusion, very little study has been done in the context of this research framework. This present study offers new perspectives for firms, addressing their strategic agenda especially from the context of the above variables.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the methodology, the theoretical framework, research hypotheses, research design, sampling design, population, unit of analysis, operationalization of constructs, and data collection. It also discusses in depth the survey instrument and data analysis. Finally, it highlights the form in which the data and findings are presented.

The approach used in this research is quantitative which it emphasizes on analysis of numerical data or figures by statistical methods, and applies inferential research or testing hypotheses in order to identify significant relationships between the variables that are being examined. Quantitative research commonly involves a survey of a larger number of respondents and thus allows a higher degree of generalization of the results, and model testing through multivariate statistical tools (Herzog, Boomsma & Reinecke, 2007; Hair, Black, Babin, & Anderson, 2010; Tabachnick and Fidell, 2007).

The research is inductive, involving the collecting of data in the field in order to find out the factors, elements, and nature or the phenomenon under investigation (Nazir, 2011; Azwar, 2004). Creswell (2013) and Harrison and Reilly (2011) argued that quantitative methods are best used to test or verify theories, and identify significant variables for future study and related work.

3.2 Theoretical Framework

In order to provide a comprehensive and yet integrated understanding of the research, this section explains its theoretical framework. The applied framework observes the influence of business environment in determining the strategic plan to generate a high-quality, competitive and sustainable organization, as illustrated in Figure 3.1.

This framework is supported by RBV and Dynamic Capabilities (Teece, Pisano & Shuen, 1997), which describe how organizations can achieve greater performance and competitive advantage. Dynamic refers to the response of an organization to react to changes in competitive environment (Teece et al., 1997).

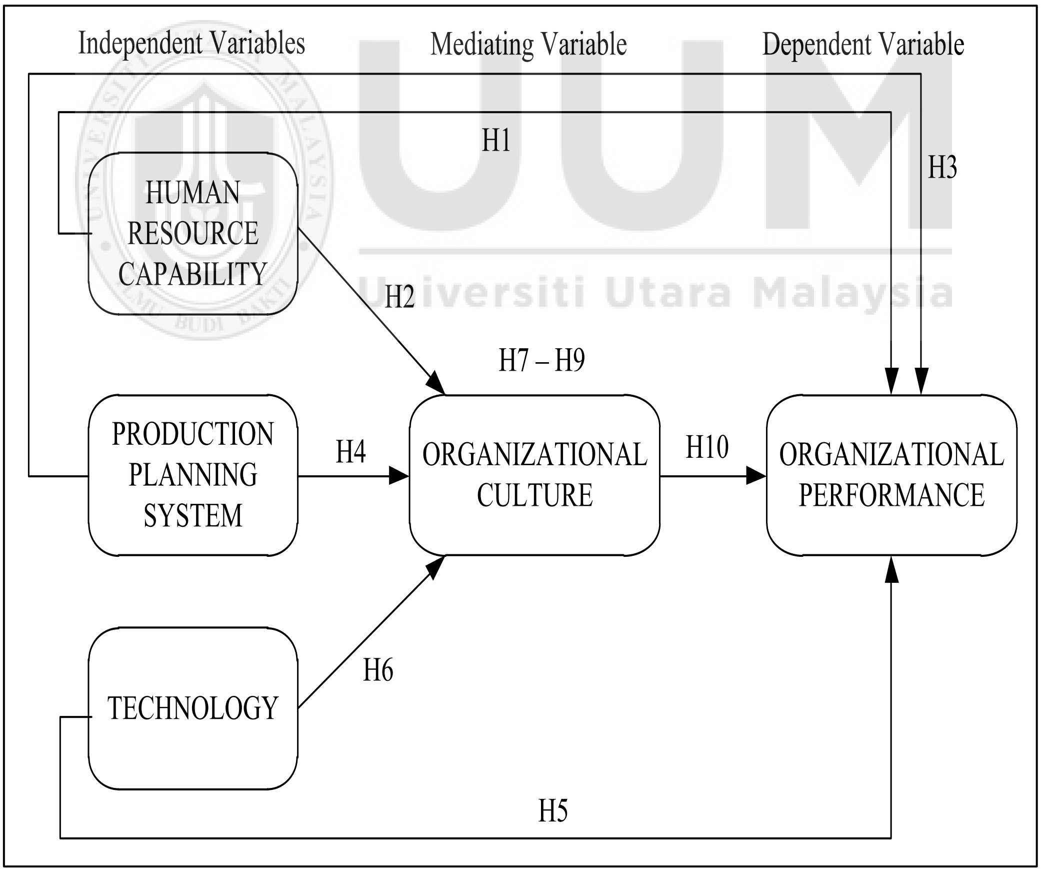

Figure 3.1
Theoretical Framework

3.3 Development of Hypotheses

After considering the research questions, objectives and theoretical framework, this study developed ten hypotheses. The researcher has already discussed the link between the strategic factors and justified the role of each variable in the framework, as the basis for constructing the hypotheses.

A hypothesis is regarded as a temporary answer to the research problem, whose truth is to be tested empirically. It is a specific statement that is predictive of the relationship between two or more variables (Kerlinger, 1973), and concretely defines what is to be achieved or what is expected to occur in the research. In short, a hypothesis is temporary description of the relationship of complex phenomena (Nazir, 2009).

Nazir (2009) defined a hypothesis as a statement of a fact that can be observed, while Good and Scates (1954) stated that is an estimate or a reference which is formulated and accepted for a while to explain the observed facts or conditions, and is used as a guide for the next research measures.

The literature review showed that the impact of HRC on OP and its involvement in developing business strategies are becoming increasingly important particularly in high tech SMEs (Karami, 2004). In the light of a RBV and DC, HRC including skilled human resources, innovative human resources, human resource effectiveness, human resource commitment, and training competent of human resource are factors that determine the competitive advantages of a firm (Karami, 2004; Dyer and Reeves, 1995; Analoui, 1999a).

Considering the background, the subject and the objectives of the research, the following hypotheses were proposed:

H1 : Human resource capability has an effect on organizational performance

H2 : Human resource capability has an effect on organizational culture

The literature review indicated that PPS can affect OP. PPS is a component of production or operations management, which aims to produce goods and services of the right quality and quantity at the right time and cost (Heizer and Render, 2011; Jarkas and Bitar, 2011; Sarjono, 2014). Good PPS transforms inputs into good outputs and achieves organizational goals (Schank and Abelson, 2013; Simons, 2013).

Simons (2013) described the scope of operations management includes three main aspects; 1) PPS, which includes product planning, factory location planning, factory layout planning, planning the work environment, and planning production standards, 2) production control system which controls the production process, materials, labour, cost, quality and maintenance, 3) productions information systems: which includes organizational structure, production on the basis of orders, and mass production. The following hypotheses were therefore proposed:

H3 : The production planning system has an effect on organizational performance

H4 : The production planning system has an effect on organizational culture

Technology is a crucial strategic variable for rapid socio-economic development in today's competitive environment, and can be the key to a prosperous successful firm

(Al-Najjar, 2014). Providing technical support contributes to increased productivity and efficiency of the productive process because it decreases the learning cost of new technology, making transference and adoption of technology more efficient (Loydell, 2012).

To maximize technology usage, organizations need employees with a good level of skills. In the production system, employees should be well informed about their organization in terms of its social, technical and environmental components, and encouraged to be assertive and learn multiple skills (Chaplin, et al., 2011; Dennis and Dowswell, 2013).

The employees are empowered with technology to make design and process change and to help both product and process improve respectively (Netland, 2013). In relation to technological empowerment, the following hypotheses were proposed:

H5 : Technology has an effect on organizational performance.

H6 : Technology has an effect on organizational culture.

OC the underlying values, beliefs and principles that serve as foundation for an organization management system as well as a set of management practices and behaviours that both exemplify and reinforce those basic principles (Amah and Ahiauzu, 2014).

Kotter and Heskett (1992) and Stoner and Wankel (1996) showed that OC has a strong impact on OP. Other studies support this belief (Sokro, 2012; Racelis, 2010;

Fard et al., 2009; Mathew 2007, Roseal et al., 2008). Racelis (2010), identified a positive and significant relationship between a strong OC and OP.

OC also mediates the relationship between HRC, PPS and technology (Simons, 2013; Sokro, 2012; Trivellas and Dargenidou, 2009; Karami, 2004). From the above discussion, it is apparent that OC is an important factor in improving OP. Therefore, the following hypotheses were proposed:

Hypothesis 7: Organizational culture has a mediating effect between human resources capability and organizational performance.

Hypothesis 8: Organizational culture has a mediating effect between the production planning system and organizational performance.

Hypothesis 9: Organizational culture has a mediating effect between technology and organizational performance.

Hypothesis 10: Organizational culture has an effect on organizational performance.

3.4 Design of Study

A research design can be defined as an action plan in getting from here to there, where here may be the initial set of questions to be answered, and 'there' is the set of answers or conclusions about these questions (Babbie, 2004). A quantitative study is defined as an inquiry into a social or human issue based on the testing of a theory that consists of a number of variables measured with numbers and analysed with statistical procedures to determine whether the predictive generalizations of the theory hold true (Creswell, 2014).

Fowler (1988) and Zikmund (2003) explained that survey design can also provide a quantitative or numeric description of some fraction of the population (sample) through the data collection process, asking questions of people and analysing the required information. The amount of data collected, in the current study enabled the researcher to generalize the findings from the responses the sample population. Based on these suggestions, the survey method is considered suitable and therefore was employed in this research.

This study consists of three independent variables (HRC, PPS and technology), one mediating variable (OC) and one dependent variable (OP). Since the variables are neither controlled nor manipulated, the main concern is relationships among them, and the ability of the independent and mediating variables in explaining and predicting the value of the dependent variables.

A quantitative cross-sectional survey method was applied, the data gathered only once and representing the issue at a specific time. Although, several publications recommend the longitudinal method to enrich the quality of the data, this is time-consuming and expensive (Sekaran, 2005).

The unit of analyses refers to the type of unit that a researcher investigates during measurement of the variables (Neuman, 2003). In this case the unit of analysis is the organization, specifically SMEs in automotive and metal sector in West Java. The owner (owner and director), or managers of SMEs as representative of the firms.

3.5 Population

3.5.1 Population of Respondents

A population is defined as all the members of any well-defined class of people, events or objects (Ary, Jacobs & Razavieh, 2002). The targeted population for this study the automotive and metal sector industries in West Java. According to Centre Bureau of Statistic (i.e. Biro Pusat Statistik, or BPS) (2014) and Kelompok Baku Lapangan Usaha Indonesia (KBLI 2009), there were industries with codification of the industry group is codified as forging, pressing, moulding and forming of metal. The subcategories included are: 1) industrial forging, pressing, stamping and metal forming, and 2) powder metallurgy industry, namely the production of metal goods directly from metal powder by heating or under pressure (KBLI 2009).

This study investigated SMEs in the metal and automotive sectors listed on the Industry and Trade Department of West Java. There are 450 of these SMEs in Bandung, Cimahi, Karawang, and Bekasi.

3.5.2 Sample size

Ideally, a sample size should be chosen to achieve the most desirable balance between the chances of making errors, the costs of these errors and the costs of sampling. The purpose is to find an optimal sample size, which minimizes the total cost of sampling error. A large sample is much more likely to be representative of the population (Aryet al., 2002; Gill and Johnson, 2002). The sample plan used in this study is also included in the research design.

Malhotra (2010) suggested the following pointers in considering the sample size of a study: (1) importance of the decision, (2) nature of the research, (3) number of variables, (4) nature of the analysis, (5) size of sample, (6) incidence rates, (7) completion rates, and (8) resource constraints. In addition, according to Cohen (2007), to determine the required sample size of a research plan, one may predetermine the significance criterion α and the desired degree of statistical power to be achieved.

The expected population *r*, referred to as the effect size, must also be specified. Cohen, Manion & Morrison (2007) argued that the larger the sample size, the smaller the error and the greater the precision of the results. This will strengthen the probability of detecting the phenomena under the test.

They also argued that selecting a representative sample of the population is better than having a large but biased sample leading to erroneous statements about the population. Thus, the researcher has selected the sample of this study cautiously, bearing in mind the numerous precautions and recommendations of experienced scholars.

According to Krejcie and Morgan (1970), the appropriate sample size (n) for a population (N) of $440 < N < 460$ is 207, that is respondents from 207 firms (minimum sample size) as a respondent that is from SMEs automotive and metal sector West Java, Indonesia. In line with previous studies, to reduce the no-response error, this study was taken larger than the minimum sample size (Al-Ekam, 2013; Shamsudin, 2012; Hair, Wolfinbarger & Ortinau., 2008).

However, Malhotra (2008) stated that nature of the study, importance of the decision, number of variables, nature of analysis, size of sample and resource constraints are important factors which need to be considered before selecting the final sample size. In this study, 370 questionnaires were distributed to respondents in West Java According to Lei and Lomax (2005) the minimum sample size as a prerequisite for data analysis is 100, and the most appropriate sample sizes is used between 250 – 500 for studies using SEM analysis.

Questionnaires were therefore distributed to 370 metal and automotive and metal sectors SMEs registered in West Java.

Table 3.1
Number of Questionnaires by Area

No.	City/Regency	Questionnaires		
		Field Test		
		Distribution	**Received**	**Usable**
1.	Bandung City	120	120	120
2.	Bandung Regency	30	30	40
3.	Bandung Barat Regency	40	40	40
4.	Cimahi City	40	40	40
5.	Karawang Regency	70	65	60
6.	Bekasi Regency	35	35	30
7.	Bekasi City	35	35	30
	TOTAL	370	365	360

3.6 Research Instrument

Questionnaires are essential to and most directly associated with survey research (Babbie, 2004). The primary data for this study were collected through a standardized, structured and self-administered questionnaire (Appendix A). The researcher employed five previously used instruments, which had been validated by expert researchers (practitioners and academics) and found to be reliable and had been used in many other studies.

The questionnaire was divided into two main parts: Part A (demographics of respondents), and Part B (research instrument comprised five sections). Part A consisted of the statements regarding position, educational level, gender, age, work experiences, employment status, and number of employees (Oei, 2010; Nurjanah, 2008; Wibisono, 2012).

Part B comprised of five sections, based on the literature, the researchers make the HRC instrument, PPS, Technology, OC and OP as the best instrument to use in this study. The first section measured HRC (Karami, 2004). In the light of RBV, HRC was represented by human resources that were skilled, innovative, effectiveness, commitment, and well trained (Karami, 2004; Oei, 2010).

The section was based on questionnaires used by Wibisono (2012); Oei, (2010); and Karami (2004). To measure the 28 detailed factors (see Appendix A), the technique adopted by many research's was used: respondents were required to determine the degree to which they agreed that the itemized statements reflected HRC as developed in their organization, using a Likert scale where 1 = 'not all important' and 7 =

‘extremely important’. The same ranking was used in the other four sections. The items statement can be seen in the following table.

Table 3.2
Operational Definition HRC Variable

Variable	**Operational Definition**	**Indicator**	**Measurement**
HRC	HRC refers to ability of possessing, acquiring or ability to access the optimise combination of required resources, system and structure that is required to deliver the firm output that is according to the specified level of customers in term of performance on an on-going basis into the future (Wibisono, 2011; Karami, 2004; State Service Commission, 1999).	1 Attention and put the employees in accordance with their education level	Likert scale where 1 = ‘not all important’ and 7 = ‘extremely important’
		2 Skilled human resources in their respective sectors to achieve company goals at operational level	
		3 Skilled human resources in their respective sectors to achieve company goals at managerial level	
		4 Human resources to carry out its duties effectively to achieve company goals	
		5 Human resources to carry out the work and synergize tasks with other employees to achieve organizational goals	
		6 Human resources that can communicate well in their respective sectors	
		7 Human resources skilled in critical thinking and analytical	
		8 human resources eager to learn continuously	
		9 Human resources to figure role model for other employees	
		10 Human resources capable of coordinating the major activities of the company	
		11 Human resources capable of coordinating staff companies achieve organizational goals	
		12 Human resources that can provide creative ideas in its duty to achieve and maintain the organization	
		13 Innovative human resources in carrying out his duties for achieving and maintaining organizational objectives	
		14 Responded well to the ideas submitted by employees to achieve and maintain the organization's objectives	
		15 Provides facility to get creative ideas submitted by employees to achieve and maintain the organization's objectives	
		16 Company put in the field of human resources tasks according to their abilities, at operational level	

Variable	Operational Definition	Indicator	Measurement
		17 Company put in the field of human resources tasks according to their abilities, at managerial level	
		18 Provides the facility at the managerial level in order to work well for the field of tasks and abilities	
		19 Always of pay attention to competence of the employees by involving the certification of expertise in accordance with its work	
		20 Always involves the employees of the competencies that need to be improved to achieve higher qualifications	
		21 Provides the opportunity for its human resources for training for the field assignment to enhance knowledge and skills	
		22 Provides the opportunity for its human resources for training/apprenticeship as field duty to enhance creativity and innovation	
		23 Is always a training/ internship and submit a report in accordance with his duties related	
		24 Has been providing infrastructure and work environment in accordance with applicable regulations to achieve corporate goals	
		25 Human resource comply with the rules governing their work to achieve the company's goals	
		26 Has a very loyal human resource/loyal to sustain and achieve organizational goals	
		27 Has a permanent human resources working in the company because of loyalty to the company	
		28 Always provide compensation to employee performance	

In the second section of 33 items, the instrument questionnaires employed by Wild (2003), Heizer et al., (2011), Apple (1993) were adapted to measure the PPS variable (see Appendix A). Respondents were required to assess the extent to which they conferred the items increased productivity and affected OP, as showing in table 3.3. These items represent statement to elaborate about: (1) production planning; (2) factor locational planning; (3) location of production facilities planning; (4) working planning and (5) planning working standard.

Table 3.3
Operational Definition PPS Variable

Variable	Operational Definition	Indicator		Measurement
PPS	PPS is a sub part of production management or operations management, which aims to produce goods and services of right quality and quantity at right time and with right manufacturing cost (Heizer and Render., 2011; Sarjono, 2014)	1	Has a good production planning for the company's production capacity	Likert scale where 1 = 'not all important' and 7 = 'extremely important'
		2	Has a proper planning and the right design for the company's goals	
		3	Has an effective utilization of resource	
		4	Has a production flow	
		5	Coordinating the activities of the department	
		6	Improve labour productivity	
		7	Helps company to capture the market	
		8	Generates customer satisfaction	
		9	To reduce production costs	
		10	To production requirements	
		11	Makes the plant layout according to production requirements	
		12	Layout of materials and equipment according to production needs	
		13	Production space in accordance with the requirements of work activity/production	
		14	Has a production plant that is broadly in line with the needs and requirements of the production facilities	
		15	Makes manufacturing facilities in accordance with the requirements for production quality	
		16	Chooses a good business location	
		17	Chooses the location of the plant in accordance with the requirements for the production of quality improvement	
		18	Chooses the location of the plant in accordance with the needs of production and attention to environmental factors	
		19	Has the ease in obtaining human resources would be an employee or worker	
		20	Effective and efficient in accordance with the planned production activities	

Variable	Operational Definition	Indicator	Measurement
		21 Planned to carry out the activity of production / labour safely and comfortably	
		22 Has been designed to carry out the activity of production / labour safely and comfortably	
		23 Has a good level of security to run production activities / work safely	
		24 Work has been well designed and has a clear operating procedure standard	
		25 Every worker has the documents to carry out the duties and functions	
		26 Every worker has the duties and functions that are clearly stated	
		27 Every worker always pay attention to good environmental conditions	
		28 Every task has a standard time	
		29 Every worker conducted continuously	
		30 Every worker using methods appropriate to the type of work	
		31 Every worker uses a machine that fit the job	
		32 Every worker using materials that fit the job	
		33 Every worker using equipment that fit the job	

In the third section, 16 indicators of technology were presented (see Appendix A). Questionnaires employed by Wibisono (2011), Loydell (2012), Cohen, Killgore, White, and Silveri (2014) and Pusparini et al. (2013) were adoption. Respondents were required to determine the degree to which the items reflected the extent of their usage so as to be competitive in their respective industries, as well as improving .performance, as shown in the table 3.4.

Table 3.4
Operational Definition Technology Variable

Variable	Operational Definition	Indicator		Measurement
Technology	Technology is the collection of techniques, skills, methods and processes used in the production of goods/services or in the accomplishment of objectives, such as scientific investigation (Liddell, and Scott, 1980)	1	Supported by human resource with an appropriate level of technical ability to use the technology	Likert scale where 1 = 'not all important' and 7 = 'extremely important'
		2	Supported by human resource with good social skills to use the technology	
		3	Employees with appropriate technical skills to take care of equipment/machinery	
		4	Employees with the technical skills and the right skills to repair the equipment/machinery	
		5	Employees with the appropriate level of technical education with job	
		6	Employee with a good level of knowledge in the use of technology	
		7	Employees with the level of technical knowledge and skills appropriate to repair the equipment/machinery	
		8	Employees with the right skills to maintain a job environment	
		9	Good equipment and has a technical life was pretty good machine	
		10	Employees always consider the effectiveness of the technology to support the production process	
		11	Always operated the machine in accordance with the technical specifications of the machine	
		12	Regularly scheduled engine maintenance	
		13	Never lost the production process, even though the machine is down for maintenance	
		14	In production activities, our organization on a machine with an optimum time	
		15	Within one month of production activities, our organization ever made a repetition of work, due to engine failure	
		16	Within one month of production activities, our organization often makes repetition of work, due to operator error	

In the fourth section, the research instrument eight statements to measure the extent to which the OC had been develop in their company to make them competitive in their business world (see Appendix A). The items were adapted from the questionnaire employed by Simon (2013), Racelis (2010), Trivellas and Dargenidou (2009) and Robbins (2008). The items were developed in the organization is:

Table 3.5
Operational Definition Organizational Culture Variable

Variable	Operational Definition	Indicator		Measurement
Organizational Culture	Shared values, beliefs, expectations, assumptions and norms are factors that make OC and keep the system and people together that distinguishing the organization from other organizations (Schein, 2010; Robbin, 2006; Denisson, 1990).	1	Every human resource devotes all his ability to work	Likert scale where 1 = 'not all important' and 7 = 'extremely important'
		2	Every human resource organizes his own work	
		3	Every human has a good relationship with one another	
		4	Every human has the ability to take the initiative	
		5	Each meeting are made on time	
		6	Everybody always pay attention to the costs incurred	
		7	Every human feeling secure with their jobs	
		8	Every human resource proud and appreciated	

In the fifth section, the research instrument measured of organization performance. To measure these factors, the researcher adoption the questionnaire employed by Wibisono (2011), Robbins (2008), Hilman (2009), Kaliappen (2014) Kaplan and Norton (1996). Respondents were required to determine the degree to which they believed that the items made them competitive in their respective industry, as well as improving performance. There were seven OP indicators (see Appendix A).

Table 3.6

Operational Definition Variabel Organizational Performance

Variable	Operational Definition	Indicator	Measurement
Organizational Performance	This study follows the definition provided by as the measure used to evaluate and assess the success of an organization to create and deliver value to its external and internal customers (Antony and Bhattacharyya, 2010)	1 Return on sales (ROS) 2 Return on investment (ROI) 3 Market share 4 Sales growth rate 5 Innovation and learning perspective 6 Customer perspective 7 Iinternal business perspective	Likert scale where 1 = 'not all important' and 7 = 'extremely important'

All the statements in the questionnaires are primarily written in Indonesian language for distribution to SMEs and Appendix A contains the English version. Although all the five set of the instruments selected for this study were shown to have substantive construct validity and reliability, they had not previously been tested in a single framework in the Indonesian context. The 7-point Likert scale continuum used to examine all five study variables was chosen on the recommendation of Allen and Rao (2000); the wider distribution of scores around the mean gives more discriminating power it is and also easier to establish covariance between two variables with greater dispersion (that is, variance) around their means. They also argued that the 7-point scale is well accepted in both the academic and industry research settings, especially for the dependent measure.

3.7 Data Collection Procedures

The quantitative survey research design was chosen for this study because it allowed a wider scope of information to be gathered quickly. Questionnaires were delivered directly (each by researcher) to 370 the head of firms. Each set of questionnaires was accompanied by a covering letter with an introduction and explanation of the purpose of the survey. To limit response errors arising from the respondents' part, certain precautions were taken such as an assurance of confidentiality and anonymity. Trust and confidence were built with the organizations since the first communication, directly questionnaires to the respondents to request for their kind participation in the study.

3.8 Data Analysis Procedures

The data analysis descriptive and inferential analysis. This study used a parametric test. Data were analyzed using descriptive statistics of frequency, percentage and mean score and standard deviation. Statistical inference is used to determine the correlation and structural equation model in answering the research questions. Cronbach alpha test was conducted to determine the reliability of the instrument, correlation analysis was performed to determine the relationship between the study variables, and structural equation modeling analysis was conducted to determine the effect of variables between study and test the effect of variable HRC, PPS, technology, OC and OP.

Several inspections of the raw data are carried for any information about the hypotheses (Neuman, 2003). An inspection can be performed through descriptive statistics to find obvious coding errors; the minimum and maximum values for each variable must fall within the admissible range. Pairwise correlations indicate that all relationships must be in the expected direction. List-wise deletion of missing values indicates whether the data can be used for analysis. Finally, the data are checked for outliers.

Collected data were analysed by using three approaches:

1) Cronbach's alpha (α) is used to test reliability. It indicates how well the items in a set are positively correlated to one another, to make ensure that the scales are free of random or unstable errors and produce consistent results over time (Cooper and Schindler, 1998).
2) Descriptive statistics (mean, standard deviation and variance) to appreciate how the respondents reacted to the items in the questionnaire. The major concern of descriptive statistics is to present information in a convenient, usable and understandable form (Runyon and Audry, 1980). A descriptive summary, including frequency, used to screen the data set. Among the most basic statistics used are mean, median, mode, sum, variance, range, minimum, maximum, skewness and kurtosis.
3) Inferential statistics are concerned with generalizing from a sample to make estimates and inferences about a wider population (Neuman, 2003). They use probability theory to test hypotheses formally, permit inferences to be made from a sample to a population, and test whether descriptive results are likely to be due to random factors or to a real relationship (Neuman, 2003). Linear regression and multiple linear regressions are used to test the predictive-ness of factors on the likelihood of the dependent variable.

The researchers used an analysis of Structural Equation Model (SEM) because it is a statistical model that can simultaneously measure the relationship between all variables and can explain the relationship between multiple variables (multiple variable) (Hair, et al., 2006). SEM capable complete a comprehensive framework to define specific measurements and complex relationship between the latent variables. SEM can measure 'multi collinearity' between variables because of the construct will be explained by other constructs. SEM can also test hypotheses using various model fitting test of statistical chi-squared (χ^2), Index splendor Model (Goodness-of-Fit), Index Comparative (CFI), Index Tucker Lewis (TLI), Root Mean Square Error of approximation (RMSEA) and Standarized Root Mean Residual (RMR). Hair, et al., (2006) have proposed several indices to determine the equivalence model;

1. Determine the chi-squared test (χ^2) and degrees of freedom (df),
2. Determine the size of a match index (GFI and RMSEA),
3. Determine the size of the increase in the index (CFI or TLI),
4. Specify the size congruity index (CFI, TLI or NFI),
5. Determine the size of the disability index of the match (or RMR RMSEA).

Most studies receive χ^2 statistics and p values for determining equivalence model. If the χ^2 larger than the p-value was significant (< 0.05) showed a significant difference between the models built with the observed data (Hair, et al., 2006). Instead, χ^2 value required is small and not significant p-value for the study explained that in accordance with the data model. However, this method is more sensitive to the number of variables and sample and cannot be used for complex models. Byrne (2010) and Hair et al. (2010) suggest a value greater than 0.90 for CFI, TLI and NFI to be a measure of how closely the model, while the RMSEA and RMR of less than 0.8 is now able to ensure congruence model (Hu & Bentler, 1999).

3.9 Preliminary Examination of Data

The computing of the statistical analysis was performed after the empirical data were screened. The examination of the raw data revealed critical characteristics. According to Hair, Black, Babin, Anderson & Tatham (2006), examining the data enable researchers to attain a basic understanding of the data and relationship between variables.

Nunnally (1994) and Sekaran (2005) stated that pilot study is strongly recommended for subjective assessment of the survey instrument, to ensure that the questions are unambiguous, understandable and that appropriate items measure the constructs. Therefore, small samples of SMEs were randomly selected for the pilot study; 100 questionnaires were distributed directly (by hand) and 80 responses received, out of which real study.

3.10 Assessment of Outliers

According to Keller and Warrack (1997), an outlier is an observation that is unusually small or large. Outliers assisted researchers in detecting coding errors. The administration of the structural equation modelling, especially the variance and covariance among the observed variables, might be distorted by the presence of outliers. Nevertheless, Bagozzi and Baumgartner (1994) suggest that outliers are not recommended to be routinely excluded from further analysis. Hence, in this study, measuring the multivariate outliers was dealt with the Mahalanobis distance test. To detect whether data is categorized with outliers or not, then we use the standard value of 3.29. This means that data that is greater than 3.29 or smaller than -3.29 is considered outliers data is unreasonable. In SPSS, sort the Z values by Ascending, to see if the data is greater than 3.29 or smaller than -3.29.

If we have responded to the lost value and the outliers value, then the final step is to replace the missing value with the average series value as provided by SPSS. Field (2013) mentions four types of data transformations, namely: log transformation of the square root transformation, inverse transformation, and transformation of opposite values. The first three data transformations: logs, square roots and inversely proportional can be used to improve the skew positive and unequal variants. Whereas, the transformation of the opposite value can be used as a step to negate the negative slope. Leech, Barret and Morgan (2005) provide another alternative change the lost value in one way such as interpolation, imputation, or by replacing the lost value with the mean or middle value. In this posts, data transforms method by using a mean surrogate value aims to populate missing values in the data. The goal is to balance the mean value.

3.11 Assessment of Normality

Normality refers to the shape of the data distribution for individual metric variables and its correspondence to the normal distribution (Hair, Black, Babin, Anderson, & Tatham, 2006). Normality consists of multivariate normality and multivariate normality. Multivariate normality can be tested by examining skewness and kurtosis. Skewness and kurtosis should be within the +2 and -2 range when the data are normally distributed (Chou and Bentler, 1995; Pallant, 2001).

According to the central limit theorem, regardless of the shape of a population, the distribution of sample means and proportions are normal if sample sizes are large, i.e. more than 30 (Hair et al., 2006). Sekaran (2003) suggested that the approximation to normality of the observed variables could be investigated by inspecting the data through histograms, stem-and-leaf displays, and prohibit plots, which indicate the symmetric distribution of variables; and by computing multivariate measures of skewness and kurtosis.

Tabachnick and Fidell (1996) suggested that the value of skewness and kurtosis is equal to zero if the distribution of a variable is normal. Chou and Bentler (1995) emphasized that absolute values of multivariate skewness indices greater than 3 are extremely skewed. Meanwhile, a threshold value of kurtosis greater than 10 can be considered problematic and a value greater than 20 can be considered as presenting serious problems (Hoyle, 1995; Kline, 1998).

3.12 Assessment of Multi co-linearity

In statistics, multi co-linearity (also co-linearity) is a phenomenon in which two or more predictor variables in a multiple regression model are highly correlated, meaning that one can be linearly predicted from the others with a substantial degree of accuracy (O'Brien 2007; Hair et al., 2010). Tests of multi co-linearity refer to the relationship among the independent variables. Multi co-linearity exists when the independent variables are highly correlated (r = 0.9 and above). Singularity occurs when one independent variable is actually a combination of other independent variables (e.g. when both subscale scores and the total score of a scale are included).

Multiple regressions do not like multi co-linearity or singularity and these certainly do not contribute to a good regression model (O'Brien 2007; Hair et al., 2010).

Indicators that multi co-linearity may be present in a model (O'Brien 2007; Hair et al., 2010) are:

1. Large changes in the estimated regression coefficients when a predictor variable is added or deleted
2. Insignificant regression coefficients for the affected variables in the multiple regression, but a rejection of the joint hypothesis that those coefficients are all zero (using an *F*-test)
3. If a multivariable regression finds an insignificant coefficient of a particular explanatory variable, yet a simple linear regression of the explained variable on this explanatory variable shows its coefficient to be significantly different from zero, this situation indicates multi co-linearity in the multivariable regression.
4. Some authors have suggested a formal detection-tolerance or the Variance Inflation Factor (VIF) for multi co-linearity:

   Tolerance = 1 - + R_j^2, **VIF** = $\frac{1}{tolerance}$

   Where R_j^2 is the coefficient of determination of regression of explanatory *j* on all the other explanatory variables, a tolerance of less than 0.20 or 0.10 and/or a VIF of 5 or 10 and above indicates a multi co-linearity problem.

3.13 Validity and Reliability

Before exploring and describing the effect of HRC, PPS, technology and OC on OP, it was deemed necessary to gauge the extent of reliability and validity for each of the instruments used in the study.

3.13.1 Validity Test

Researchers should pay attention to the quality of the data, which is generally tested with the help of reliability and validity diagnostics (Diamantopoulos, Sarstedt, Fuchs, Kaiser, & Wilczynki, 2012; Hooghe, Bakker, Brigevich, de Vries, Edwards, Marks, Rovny, Steenbergen, & Vachudova, 2010). Validity tests assess the ability of the questionnaire to measure appropriately the construct for which it has been developed.

It also ensures whether the questionnaire is understandable by the respondents. Robson (2002) defined validity as the degree to which what is observed or measured is the same as what was purported to be observed or measured. Webb, Shavelson & Haertel (2007) described the most popular method for assessment of questionnaires, consisting's of five dimensions; content, articulation, equity and fairness, pedagogy, and system applicability (Li and Sireci, 2013).

Questionnaires adapted from languages and cultures other those of respondents, are required to have their contents validated accordance local culture and context, keeping in mind that the sense and measurement properties should remain the same as those provided in the original questionnaire (Juniper, 2009). There is a risk associated with using a questionnaire across different cultures, different meaning and interpretation. To counter this problem, the content of the questionnaire was translated with the help of an expert, so that the sense of the questionnaire was maintained and the tool used for data collection would be a reliable source of data collection. Two validity tests were conducted, for content and construct.

3.13.1.1 Content Validity

Content validity refers to an expert's opinion on how well all measures correspond with what they are meant to assess (Milfont and Duckitt, 2010; Thornberry and Krohn, 2000). In this way, each item of the construct is assessed and modified in line with theoretical constructs.

Newman, Lim & Pineda (2013) suggested that a specification table is the best way to assess the content validity with the agreement of the experts on particular items of the constructs. A table with a feedback system is more easily implemented for inclusion of new information from the literature. Hence, the interactive table can provide a frame for developing content validity estimates.

Given that content validity is based on the subjective opinion of an expert in the field, it does not lend itself to statistical analysis (Diamantopoulos, Sarsted, Fuchs, Kaiser, & Wilczynzki, 2012), but is a starting point rather than a benchmark for assessing validity.

3.13.1.2 Construct Validity

Construct validity represents the effectiveness of measurement items when they are applied in research (Bryman and Bell, 2011) and how well indicators serve as proxies for the theoretical constructs they have been designed to measure (Diamantopoulos et al., 2012). Construct validation theory has emerged from development and evaluation of quantitative measures in scientific inquiry, to investigate constructs for which clear operational criteria do not exist (Slaney, 2012).

Determining construct validity involves examining the extent to which a measure's performance is similar to that of comparable items used in the field of study (Chang and Krosnick, 2010). In order to achieve accuracy of the measured construct, it must be adapted according to the social context of the study. Translation can affects the design and development of a questionnaire adopted for use across cultures.

The current study followed the process of selecting of appropriate wording proposed by Burn and Bush (2009), first, focusing on a single issue for each item in order to set the appropriate context for a question, some questions may have double issues. Secondly, the respondents should be able to interpret the questions in the same way as that posed by the researcher. The third suggestion was to avoid the use of trade jargon. The current questionnaire was developed, with a simple grammatical structure that could be easily understood by the respondents.

The pilot study has been tested the validity of each statement, as answered by 80 respondents, using Spearman's rank correlation. Results showed that all the correlation between item-totals of all the variables have a significance value less than 0.05, so that all the items declared valid (Appendix B).

3.13.2 Reliability Tests

It is impossible for social scientists to develop methods and measures that perfectly capture the processes they intended to study, which makes the presence of random error inevitable (Diamantopoulos et al., 2012; Bryman et.al, 2011). However, random error can be assessed and minimized by different tactics. A basic approach to dealing with random error is to improve reliability, and the reliability test aims to examine the consistency level of the proposed measures. Similar results under consistent conditions indicate a measure of high reliability.

This study performs two types of calculation reliability Cronbach alpha calculations performed through the program SPSS 16.0. Acceptable reliability values according to now (2003) and Hair et al. (2006) confirmed above 0.60. Composite reliability (CR) is then performed, although Cronbach alpha is usually used as a reliable indicator, but some studies have reported disparagement (Bollen, 1989; Raykov, 1997a and 1997b; and Chin, 1998a). The obstacle begins with the underlying assumption of Cronbach alpha that mentions the path coefficient of latent factor to the measured item is expected to be the same, or all measured items are equally weighted. If the value fails to meet assumptions, Cronbach's alpha underestimates its reliability.

Werts et al. (1974) provides an alternative choice by creating composite reliability to assess the reliability of a set of indicators. CR relaxes the reasons behind Cronbach's alpha assessment and this is a closer approximation to the assumption that accurate parameter estimation (Chin, 1998a) and since then is seen as a superior measurement compared to Cronbach alpha (Fornell & Larcker, 1981). CR is calculated with almost all SEM software.

Vehkalahti, Puntanen & Tarkkanen (2006) defined reliability, as the ratio of the true variance to the total variance of the measurement which does not include the variance of the random measurement error. Results vary from 0 to 1 and a value larger than 0.6 is considered as acceptable. The similarity measurement level refers to the ratio of the true variable to the total variance of measurement (Byrne and Van De Vijver, 2010), and a coefficient of 0.6 or less generally indicates unsatisfactory internal consistency reliability (Malhotra, 2004). In the social sciences, acceptable reliability estimates ranges are from 0.70 to 0.80 (Nunnally and Bernstein, 1994).

Cronbach's alpha is more popular method to test reliability compare to than other methods, e.g. Composite Reliability (CR) and Average Variance Extracted (AVE). The formula for Composite Reliability and Cronbach's alpha are as follows:

$$\text{Composite Reliability } (\rho) = \frac{(\sum \mathrm{i}\ \lambda \mathrm{ij})^2}{(\sum \mathrm{i}\ \lambda \mathrm{ij})^2 + \sum i\ var\ (\mathcal{E}ij)}$$

Where λ (lambda) represents the loading of indicator variable i from a latent variable, represents error of variable, i and j is the flow index across all reflective measurement models, and ε is the error variance of each construct. The standardized loading can be obtained from the AMOS output and the error variance is the remainder after from subtracting the squared standardized loadings from 1.

$$\text{Cronbach's alpha: } \alpha = \left(\frac{\mathrm{N}}{N-1}\right)\left(1 - \frac{\sum_{i=1}^{N} \sigma_i^2}{\sigma_t^2}\right)$$

N is the number of indicators assigned to the factor, the variance indicator for i.

It appears that composite reliability focuses on loading the indicator variable and error variable, while Cronbach's alpha consider the variance of the indicator. Cronbach’s alpha measures the reliability of individual items, while Composite Reliability examines the construct or latent variable reliability. Cronbach's alpha is a traditional reliability measured which assumes that all factor loadings are constrained to be equal, and all error variances are constrained to be equal. Raykov (1998) indicates that Cronbach’s alpha may over or underestimate the reliability. This may be serious, if the test is multi-dimensional. The Critical ratio (Cr.) was developed to deal with multi-dimensional data.

Following the data validity tests the preliminary study tested the reliability of the statement items in the questionnaire as answered by the 80 respondents. Reliability ratio and Composite Reliability were used to test reliability. The results showed that all reliability value ratios and the Composite Reliability of all the variables have a significance value less than 0.05 so that all the items are reliable.

AVE measures the amount of variance in the construct in relation to the amount of variance due to measurement error. A construct has high validity if the value of AVE is greater than 0.5; 0.5 or less means the variance of measurement error is greater than the variance of construct, which indicates that the convergent validity of the construct is questionable (Byrne et.al, 2010; Hair et al., 2010).

Hair et al. (2010) presented to the AVE formula as follow:

$$AVE = \frac{\sum_{i=1}^{n} \lambda_i^2}{n}$$

Where λ (lambda) is the standardized factor loading of the item and n is the number of items measuring the respective construct.

3.13.3 Method of Successive Interval (MSI)

The Method of Successive Interval (MSI) is a scaling method to raise the ordinal measurement scale to the scale of measurement interval (Garson, 2006; Asdar and Badrullah, 2016).

Measurements scales chosen by researchers are closely related to the data analysis techniques used. Therefore, any scale of measurement that is not eligible to for a specific analysis technique, must be changed or converted into the corresponding measurement scale if the research use parametric statistical analysis, such as Pearson correlation analysis or Product Moment Correlation, Regression Analysis, or Multivariate path analysis, when the condition data should be on minimal interval scale.

As the questionnaire in this study use a Likert ordinal scale to record the data, it is necessary to transform the data into an interval scale with MSI as below (Fox, 2002; Garson, 2006):

1. Note the value of the answer to every question in the questionnaire
2. Determine the frequency of each response
3. Determine the proportion of each response by dividing the frequency by the number of samples

4. The proportions sequentially for each response to obtain the cumulative proportion
5. Determine Z for each cumulative proportion that is considered to follow the standard normal distribution.
6. Determine the value of normal density (DF) corresponding to the value Z

$$\delta(Z) = \frac{1}{\sqrt{2\pi}} e^{\left(-\frac{Z^2}{2}\right)}, -\infty < Z < +\infty$$

7. Calculate the Scale Value (SV) for each response.
8. Change the SV so that, the smallest becomes equal to 1 and transform each scale with the smallest scale changes in order to obtain the Transformed Scale Value (TSV), as follow:

   TSV = - {Min data – Min SV}

3.13.4 Result Validity and Reliability Tests Pilot Study

In order to ensure the validity and reliability of the measurement items of the selected variables before the actual study took place, a pilot study with 80 SMEs from Bandung City was carried. The validity test checks whether the measuring instrument used for each item in the questionnaire is precise (valid) or inappropriate. The initial 92 items, answered by 80 respondents, were tested in the pilot study using Spearman's rank correlation, as explained in the previous chapter.

Simply put, the construct validity of an instrument is determined by correlating the scores of each item with the total score for each item. If r_{count} is greater than r_{table} at a certain confidence level, it means that such instruments meet the validity criteria. The confidence level used here was 95% with N = 80. Only items with a value of r > 0.241 were used in the study. The item-total (Appendix B: Result of Validity Test Pilot

Study) correlations were found to have a significance value less than 0.05, so all items were declared valid (r >*0.241*).

The reliability test measures the reliability of the questionnaire, and Table 3.7 presents the results from the pilot test, using SPSS. It shows that the reliability estimates using Cronbach's alpha ranged between 0.858 and 0.957, which exceeded the cutoffvalue of 0.70 (Nunnally and Bernstein, 1994). This indicates that the selected scales were highly reliable. However, from the pilot study the researcher was able to identify some problems in the content of the questionnaire; some questions were eliminated as being similar to other questions according to the respondents and others were rephrased according to suggestions from the respondents.

Based on Cronbach's alpha, the variables with the greatest reliability were found in HRC, at 0.957, i.e. the level of consistency of respondents' answers was very high at 95.7%. OC showed the least reliability at 0.858, which is still high. The reliability of all exceeded 0.700 (HRC= 0.957, PPS= 0.934, TECH= 0.892, OC= 0.858 and OP= 0.897), so were declared reliable. Thus, all items in the research variables could be used in subsequent analyses.

Table 3.7
Reliability: Pilot Study

Construct	Cronbach's Alpha	Composite Reliability	Result
Human Resource Capability	0.957	0.922	Reliable
Planning Production System	0.934	0.855	Reliable
Technology	0.892	0.823	Reliable
Organizational Culture	0.858	0.861	Reliable
Organizational Performance	0.897	0.898	Reliable

Note: Reliability criterion is $\alpha > 0.700$

Further reliability testing used CR, and again the results show that the greatest reliability was HCR, at 0.922. The highest level of consistency of the answers to the relationship was with OP, at 92.22%, and the lowest with OC at 0.823. All variables exceeded 0.700 (HRC= 0.922, PPS= 0.853, TECH= 0.823, OC= 0.861 and OP= 0.898) and all were therefore reliable, and could be used in subsequent analyses.

3.13.5 Confirmatory Factor Analysis (CFA)

Hair et al. (2006, 2010) suggested the research items should go through Confirmatory Factor Analysis (CFA). CFA is used to test *a priori* the extent to which factor loadings represent the actual data. This means the measurement theories are represented by visual diagrams and only the loadings that theoretically link to measured items of corresponding latent factors are calculated.

CFA is also useful to test the validity (construct validity, discriminant validity, nomological validity, and face validity) of the items (Hair et al., 2010). The first step in evaluating the results is to examine the acceptable level. Wheaton et al. (1977) suggested that the use of chi-square divided by the degree of freedom (χ^2/df) should be less than 5, which would also means that *p* value for chi-squared is significant.

The next step is assessing the overall model fit in which the indices of the model have to achieve the minimum acceptable level: the Goodness of Fit Index (GFI) indicates > 0.90, Root Mean Square Error of Approximation (RMSEA) indicates < 0.08, and Root Mean Square Residual (RMSR) indicates < 0.08 (Hair et al., 2010). Furthermore, modification indices can be used to achieve an optimal measurement model. The main purpose of the coefficients was used to assess the suitability (goodness-of-fit) for structural equation model proposed in this study. Table 3.8 shows the criteria of suitability and interpretation.

Tabel 3.8
Index Criteria Conformance and Interpretations

Suitability Index Level Accepted		Interpretation
(χ^2/df	(≤ 3.00)	Value above 3.00 indicates a discrepancy observed data with model
CFI	0 (unsuitable) to 1 (very convenient)	Value close to .9 demonstrate conformity assessment model with the observed data.
TLI	0 (unsuitable) to 1 (very convenient)	Value close to .9 demonstrate conformity assessment model with the observed data.
NFI	0 (unsuitable) to 1 (very convenient)	Value close to .9 demonstrate conformity assessment model with the observed data.
GFI	0 (unsuitable) to 1 (very convenient)	Value close to .9 demonstrate conformity assessment model with the observed data.
RMSEA	(≤ 0.08)	Values in excess of 0.08 indicate a discrepancy between model studies with the observed data.

Source: Nunnally and Bernstein (1994), Schumacker and Lomax (2010), Hair et al. (2010), Byrne (2010) dan Kline (2010)

3.14 Summary

This chapter described the research methodology, research design, sampling, data collection and analysis and measurement instruments. Most of the measurements of the variables were adapted from previous studies. The reliability and validity of most of the variables were tested and established.

CHAPTER FOUR
DATA AND ANALYSES

4.1 Introduction

The main purpose of this chapter is to describe the outcomes of the study based on the data collected from the targeted respondents through the survey questionnaire. It covers issues related to the data collection, preliminary examination of the data, namely validity and reliability instrument, data screening and cleaning, reliability, and validity of the measurements, CFA and the model fit using SPSS and AMOS. It finally presents the analysis and results of hypotheses testing.

4.2 Preliminary Examination of Data and Data Screening

The pilot test has proved that the selected variable has reliability and validity. After the researcher had ascertained the reliability and validity of these measurements, the actual data collection was carried out by distributing 370 questionnaires to SMEs automotive and metal sectors. The following sections describe in detail the results of this research.

4.2.1 Method of Successive Interval (MSI)

MSI was used to convert the results of measured on the ordinal scale to interval measurement, as recommended by Asdar and Badrullah (2016), and Garson (2006).

This study has three independent variables and one mediating variable with a total of 92 item statements to gauge the effect of HRC, PPC, TECH and OC on OP; the final sample size was 360. Application of MSI resulted in a total of 28 indicators, 5 best representing the variable HRC, 5 for PPS, 3 for TECH, 8 for OC and 7 for or OP. All 28 MSI indicators are shown in Table 4.1.

Table 4.1
Results Indicators with Method of Successive Interval

Variables	**Representative of Construct**	**Code**
Human resource capability	1. Skill	HRC1
	2. Innovative	HRC2
	3. Effective Human	HRC3
	4. Training	HRC4
	5. Commitment	HRC5
Production planning system	6. Production planning	PPS1
	7. Location of production facilities	PPS2
	8. Factory location	PPS3
	9. Workplace	PPS4
	10. Working standard	PPS5
Technology	11. Technical science	TECH1
	12. Level of skill	TECH1
	13. Physical tools	TECH1
Organizational culture	14. Ability to work	OC1
	15. Organize own work	OC2
	16. Good relationship with one another	OC3
	17. Ability to take initiative	OC4
	18. Each meeting made on time	OC5
	19. Always pay attention to the costs incurred	OC6
	20. Feel secure in jobs	OC7
	21. Proud and appreciated	OC8
Organizational Performance	22. Return on sales (ROS)	OP1
	23. Return on investment (ROI)	OP2
	24. Market share	OP3
	25. Sales growth rate	OP4
	26. Innovation and learning perspective	OP5
	27. Customer perspective	OP6
	28. Internal business perspective	OP7

4.2.2 Validity and Reliability Instrument

As demonstrated by Byrne (2010) and Hair *et al.* (2010), the main criterion in choosing an instrument from previous research is the internal consistency between items which can primarily be obtained by calculating the Cronbach's alpha for reliability and $r_{count} > r_{table}$ for validity. This study tested validity and reliability measure the accuracy and reliability of the measuring instruments used.

4.2.2.1 Validity and Reliability Tests: Field Study

Results of the tests in the main study (N = 360) were similar to those in the pilot. The confidence level used in testing the validity of the items was 95%, and items with a value of r > 0.241 were used.

Overall, the item-total (see Appendix C) correlations had a significance value less than 0.05 so that all the items can be said to be valid (r > 0.241).

The results of the reliability tests are shown in Table 4.2. Composite Reliability (CR) values ranged from 0.876 to 0.932, indicating that all constructs had acceptable reliability (internal consistency above 0.7). This result provides support for convergent validity (Hair *et al.*, 2010), as the criteria indicate that the model established all latent variables with a high reliability (Nunnally and Bernstein, 1994), i.e. the selected scales were highly reliable.

Table 4.2
Reliability: Field Study

Construct	Cronbach's Alpha	Composite Reliability	Result
Human Resource Capability	0.932	0.868	Reliable
Planning Production System	0.924	0.886	Reliable
Technology	0.878	0.858	Reliable
Organizational Culture	0.877	0.879	Reliable
Organizational Performance	0.876	0.877	Reliable

Note: Reliability criterion is α *> 0.700*

The variable with the greatest reliability was PPS at 0.886, showing that the level of consistency of the answers was 88.6%. TECH scored lowest at 0.858, but still well above the cut-off point of 0.700. The table confirms that all the items are reliable and can be used in subsequent analyses.

The result of calculation of composite reliability (CR) and Cronbach alpha values in this research shows acceptable reliability value that is above 0.7. The results of this study provide the view that composite reliability (CR) and Cronbach alpha values calculation alike relax the accurate parameter estimation.

4.2.2.2 Comparing Validity and Reliability Tests

Comparison of this test is intended to see whether there is a difference between the data taken during the pilot test with field tests. From the results of validity and reliability tests, there was no difference in the results of both. Overall, the value validity Pilot and Field study (see Appendix C) to have gaps between 0.013 - 0.427

and correlations a significance value of 0.05 so that all the items can be said to be valid (r> 0.241).

The result reliability tests indicated by a very small gaps, difference between 0.010 - 0.025, as shown in Table 4.3 for comparing alpha Cronbach's. Thus the Field Test data has the same validity and reliability as the pilot test.

Table 4.3
Comparing Reliability (Cronbach's Alpha) Pilot Study versus Field Study

Construct	Cronbach's Alpha Pilot Study	Field Study	Gap
Human Resource Capability	0.957	0.932	-.025
Planning Production System	0.934	0.924	-.010
Technology	0.892	0.878	-.014
Organizational Culture	0.858	0.877	-.019
Organizational Performance	0.897	0.876	-.021

Note: Reliability criterion is α *> 0.700*

Similarly, the comparison of CR values, having relatively small gaps, difference between 0.018 - 0.054, is shown in Table 4.4.

Table 4.4
Comparing Reliability (Composite Reliability) Pilot Study versus Field Study

Construct	Composite Reliability Pilot Study	Field Study	Gap
Human Resource Capability	0.922	0.868	-.054
Planning Production System	0.855	0.886	-.031
Technology	0.823	0.858	-.035
Organizational Culture	0.861	0.879	-.018
Organizational Performance	0.898	0.877	-.021

Note: Reliability criterion is α *> 0.700*

4.2.3 Descriptive Statistics of Constructs

Table 4.5 shows the descriptive statistics of the independent, mediating and dependent latent variables. Among the dependent variables, OP has a mean value of 4.60. The standard deviation (SD) of all variables is in the range 1.13 to 1.22, which reflects the adequate acceptable variability within the dataset. HRC has the lowest mean value of 4.34, SD 1.18, and TECH the highest mean, 4.51, SD 1.16; OC as a mediating variable is 4.47, SD 1.13. See Table 4.5.

Table 4.5
Descriptive Statistics of All Latent Variables (N=360).

Construct	Code	Original Items	Min	Max	Mean	Std. Deviation
Human Resource Capability	HRC	28	1	7	4.34	1.18
Planning Production System	PPS	33	2	7	4.41	1.18
Technology	TECH	16	1	7	4.51	1.16
Organizational Culture	OC	8	1	7	4.47	1.13
Organizational Performance	OP	7	2	7	4.60	1.22

4.2.4 Data Screening

In order to satisfy the assumptions of AMOS, different approaches to data screening were employed: detecting and replacing missing values, deleting outliers, conducting normality tests, linearity and homoscedasticity, non-response bias, and checking for multi co-linearity between constructs.

4.2.4.1 Missing Data

Missing data can affect the results (Cavana, Delahaye, & Sekaran, 2001). In the actual data here, just only 2.7 % of the returned survey questionnaires had missing values. However this is far from the requirements put forward by the researchers, according to suggestions of Hair et al. (2010), when the missing values represent more than 50% and the study still fulfils sample size requirement, researchers are advised to delete these respondents' data.

4.2.4.2 Assessment of Outliers

Outliers are any observations that are numerically distant from the rest of the dataset (Bryne, 2010). One way to identify them is to classify the data points according to an observed (Mahalanobis) distance from the projected values of research (Hair *et al.*, 2010; Hau and Marsh, 2004). The treatment of outliers according to the Mahalanobis distance represents an effective way of identifying them by setting some predetermined cut-off value (Van Gerrit, Gary, & Kacker, 2002).

Hair *et al.* (2010) suggest that in order to identify outliers, it is necessary to create a new variable in SPSS with the value of each response for all respondents. Specifically, Mahalanobis can easily be attained by running a simple linear regression on SPSS by selecting the variable that responds to each number and adding it to the list of the dependent variable, and adding all measurement items excluding the demographic variables in the list of independent variables.

Data outliers are used in this study in case the research data is not normally distributed or does not pass in the normality test. Data outliers according to Ghozali

(2013) are cases or data have unique characteristics that look very much different from other observations and appear in the form of extreme values for either single or combination variables. Detection of univariate outlier can be done by determining the boundary value categorized as outlier data by converting data value into standardized score or commonly called z-score (Ghozali, 2013).

Using a standard value of 3.29, with the notion that data larger than 3.29 or smaller than -3.29 is said to be outliners, the assessment of the data outliers in this study as shown in Table 4.6 shows that Z score is between standard values. Thus, no data is outliers or unreasonable.

Table 4.6
Statistical Summary of Checking Outliers

Descriptive Statistics

	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Z score(HRC1)	360	-3.01950	1.61845	.0000000	1.00000000
Z score(HRC2)	360	-2.66044	1.54809	.0000000	1.00000000
Z score(HRC3)	360	-2.91738	1.69350	.0000000	1.00000000
Z score(HRC4)	360	-3.19563	1.62477	.0000000	1.00000000
Z score(HRC5)	360	-3.00641	1.50948	.0000000	1.00000000
Z score(PPS1)	360	-2.71612	1.87327	.0000000	1.00000000
Z score(PPS2)	360	-2.58784	1.71677	.0000000	1.00000000
Z score(PPS3)	360	-3.13267	1.68511	.0000000	1.00000000
Z score(PPS4)	360	-3.23949	1.89738	.0000000	1.00000000
Z score(PPS5)	360	-2.86324	1.83308	.0000000	1.00000000
Z score(TECH1)	360	-2.45370	1.98206	.0000000	1.00000000
Z score(TECH2)	360	-2.86742	1.83006	.0000000	1.00000000
Z score(TECH3)	360	-2.44455	2.38142	.0000000	1.00000000
Z score(OC1)	360	-3.11278	3.11267	.0000000	1.00000000
Z score(OC2)	360	-3.04294	2.90268	.0000000	1.00000000
Z score(OC3)	360	-2.13135	2.85654	.0000000	1.00000000
Z score(OC4)	360	-2.42220	2.77241	.0000000	1.00000000
Z score(OC5)	360	-2.26187	2.10831	.0000000	1.00000000

	N	Minimum	Maximum	Mean	Std. Deviation
Z score(OC6)	360	-2.79254	2.93060	.0000000	1.00000000
Z score(OC7)	360	-3.11810	2.91790	.0000000	1.00000000
Z score(OC8)	360	-2.65577	2.60701	.0000000	1.00000000
Z score(OP1)	360	-2.95754	2.53515	.0000000	1.00000000
Z score(OP2)	360	-2.52622	2.36207	.0000000	1.00000000
Z score(OP3)	360	-2.32338	2.43116	.0000000	1.00000000
Z score(OP4)	360	-3.24555	2.46934	.0000000	1.00000000
Z score(OP5)	360	-2.49530	1.46627	.0000000	1.00000000
Z score(OP6)	360	-2.56351	1.71536	.0000000	1.00000000
Z score(OP7)	360	-2.36375	1.66051	.0000000	1.00000000
Valid N (list wise)	360				

4.2.4.3 Assessment of Normality

Assessing the normality of data is essential before running AMOS (Hair *et al.,* 2010), because data that are not normally distributed will have high skewness and can potentially distort the results of the tests, and hence of the hypotheses (Hulland, 1999). To overcome this issue, linearity and homoscedasticity also were tested. The results displayed in Table 4.7 show that there was no proof to challenge the linearity assumption.

Table 4.7
Assessment of Normality

Variable	Min	Max	Skew	Cr.	Kurtosis	Cr.
OP7	1.0000	5.3036	-.0428	-.3316	-.3305	-1.2800
OP6	1.0000	5.2793	-.0275	-.2131	-.2597	-1.0058
OP5	1.0000	5.4220	.0310	.2405	-.3286	-1.2725
OP4	1.0000	6.1037	.0515	.3991	-.3389	-1.3126
OP3	1.0000	5.6249	-.0035	-.0271	-.2662	-1.0311
OP2	1.0000	5.7289	-.0175	-.1358	-.2377	-.9205
OP1	1.0000	5.8496	-.0472	-.3655	-.3619	-1.4015
OC8	1.0000	5.7788	-.0331	-.2567	-.1221	-.4729
OC7	1.0000	6.7022	-.0855	-.6625	-.2922	-1.1317
OC6	1.0000	7.1458	-.1088	-.8427	-.3328	-1.2891
OC5	1.0000	6.4107	.0014	.0106	-.1874	-.7258
OC4	1.0000	5.6369	-.0855	-.6624	-.4212	-1.6313
OC3	1.0000	7.1458	-.0602	-.4662	-.3202	-1.2403
OC2	1.0000	6.6248	-.0264	-.2048	-.0762	-.2951
OC1	1.0000	5.8496	-.0373	-.2892	-.0559	-.2163
TECH1	1.4194	5.2343	.0663	.5139	-.6607	-2.5590
TECH2	1.2674	4.9513	.0331	.2565	-.1222	-.4734
TECH3	1.0000	4.9020	.1702	1.3181	1.2247	4.7431
PPS1	1.1140	4.5441	.1217	.9424	-.0509	-.1972
PPS2	1.0000	4.5490	.0231	.1788	-.0055	-.0214
PPS3	1.0000	4.7666	.0060	.0463	-.2075	-.8038
PPS4	1.0000	4.7687	.1626	1.2597	-.0343	-.1327
PPS5	1.4587	4.4535	.0094	.0730	-.4774	-1.8489
HRC1	1.2287	4.6268	-.1130	-.8753	-.4176	-1.6175
HRC2	1.2256	4.9010	.1961	1.5191	-.6099	-2.3622
HRC3	1.3169	5.2987	.1141	.8842	-.2675	-1.0358
HRC4	1.0000	5.7598	.0599	.4636	-.2545	-.9855
HRC5	1.3927	5.4091	-.1639	-1.2698	-.0851	-.3297
Multivariate					118.6065	27.4521

Note: Cr. multivariate = 27.4521 $< \chi^2_{28} = 41.337$

Table 4.7 above is the normality test for each item of HRC, PPS and TECH and the indicators OC and OP. Judging from the slope (skew) of the average scale of any dimension or scale indicator, the results show that the indicator that has the greatest absolute slope is HRC2 at 0.1961 (Cr. = 1.5191). Meanwhile, the least slope is the OC5 indicator on latent variable at 0.0014 (Cr. = 0.0106). Because the value of the critical ratio of all dimensions and indicators is less than 1.96, the distribution of the data is normal. In multivariate kurtosis all the value for all variables is 118.6065 (Cr. = 27.4521). The value of the critical ratio is smaller than the chi-squared table (Cr. multivariate = 27.4521 $<\chi^2_{28} = 41.337$) which shows that in multivariate analysis the data follow a normal distribution. Examples of the histogram curve are shown in Figure 4.1.

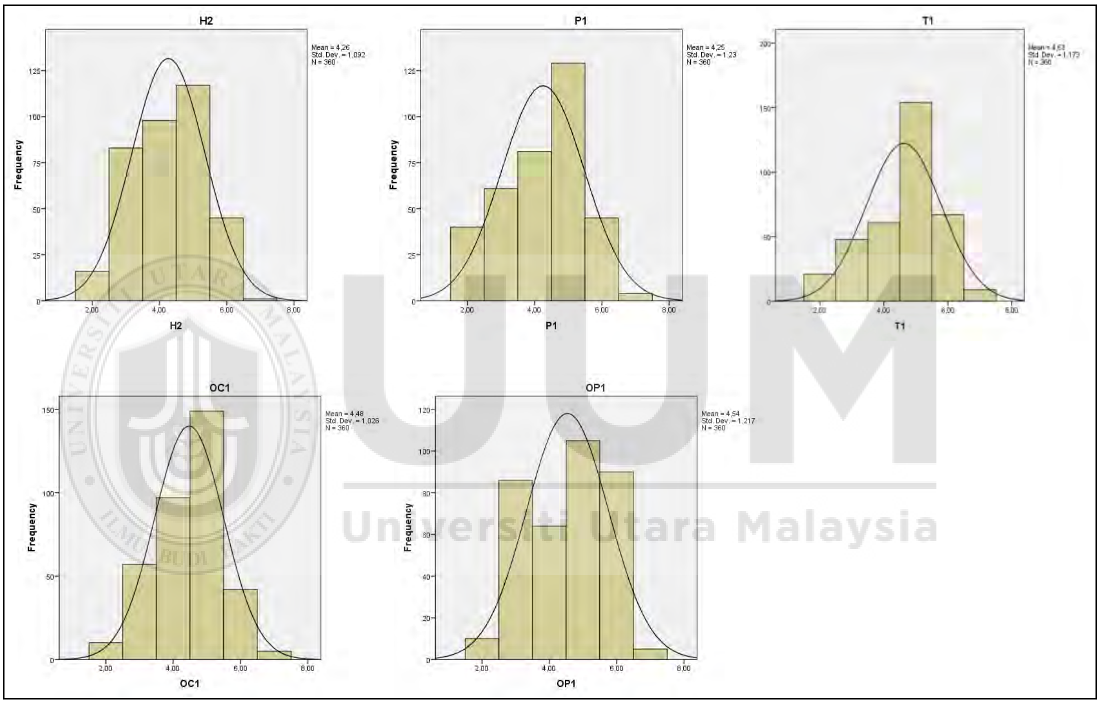

Figure 4.1
Histogram Curve for Variables HRC, PPS, TECH, OC and OP

4.2.4.4 Assessment of Multi co-linearity

Multi co-linearity occurs when the correlation matrix between any two variables is extremely high (0.9 and above) (Tabachnick and Fidell, 2001). According to Pallant (2001), multi co-linearity describes the condition in which latent variables have a high correlation with each other. This research assessed the multivariate correlation between variables through the residual analysis and the coefficients output using

AMOS and SPSS. Symptoms of multi co-linearity and singularity can be observed when the sample covariance matrix determinant is zero. Multiple regressions do not like multi co-linearity or singularity and these certainly do not contribute to a good regression model (O'Brien 2007). This indicates the presence of multi co-linearity and singularity.

Table 4.8 shows that the variance inflation factor of exogenous latent variables ranged from 1.919 to 2.101. These values are less than 5, indicating that VIF shows no symptoms of multi co-linearity between exogenous latent variables.

Table 4.8
Tolerance and VIF Values

Variable Latent Exogenous	R-Square	Tolerance	VIF
HRC	0.479	0.521	1.919
PPS	0.524	0.476	2.101
TECH	0.486	0.514	1.946

Note: Value of Tolerance > 0.10; VIF < 10

4.2.2.5 Discriminant Validity

Discriminant validity tests whether the concepts or measurements that are assumed to be unrelated are in fact unrelated. Farrell (2010) indicated that discriminant validity reflects the extent to which the items or measures of a latent variable are dissimilar or discriminated from other latent variables.

Table 4.9 shows that that the variance extracted values ranged from 0.477 to 0.670, all above the recommended critical limit of 0.5, except for variance extracted for OC.

Therefore, based on the variance extracted, latent variables have very good discriminant validity.

Table 4.9
Average Variance Extracted (AVE) Value of Latent Variables

Construct	**Variance Extracted ≥ 5**
Human Resource Capability	0.573
Planning Production System	0.610
Technology	0.670
Organizational Culture	0.477
Organizational Performance	0.507

Table 4.10 about Discriminant Validity gives the results of the calculation of the value of the square root AVE construct and the correlation between the constructs or implied (for all variables) correlations, calculated using AMOS. The latent constructs have good discriminant validity, and the entire value of the correlation is below the value of the square root AVE. Thus, the entire latent constructs in this study are capable of capturing the phenomenon being measured. The dimensions/indicators pair with the smallest discriminant validity is HRC5/OP1 at 0.0006, while the largest is HRC1/HRC5 at 0.7573.

Tabel 4. 10
Discriminant Validity

	OC1	PPS5	OP3	OC8	HRC1	OP7	OP6	OP5	OP4	OP2	OP1	OC7	OC6	OC5	OC4	OC3	OC2	TECH1	TECH2	TECH3	PPS1	PPS2	PPS3	PPS4	HRC2	HRC3	HRC4	HRC5
OC1	0																											
PPS5	-0.6277	0																										
OP3	0.3251	-1.7557	0																									
OC8	-0.4776	0.0588	-0.1405	0																								
HRC1	1.949	3.1822	0.1196	0.0939	0																							
OP7	1.9982	0.331	-1.6778	0.6158	2.3594	0																						
OP6	2.2996	-0.6275	-0.0699	0.7029	1.5289	2.723	0																					
OP5	1.0878	-1.1135	-2.4331	-0.0828	-1.4196	0.2344	1.6036	0																				
OP4	-1.815	-2.0059	3.9606	-0.2986	-0.7357	-1.4178	-1.45	-0.1039	0																			
OP2	-4.3994	-0.3165	2.9029	-1.2739	-1.7533	-2.2733	-2.9074	-1.2703	3.9323	0																		
OP1	-1.1086	-0.2653	-0.6468	0.21	-1.044	-1.8998	-0.9152	0.1085	0.252	1.7905	0																	
OC7	-1.2061	-0.5287	0.2276	0.3549	-0.7825	1.2133	0.9498	0.7804	-0.4392	-0.7055	1.5731	0																
OC6	-0.3526	0.5284	-0.7797	0.6213	-0.4109	0.1921	0.8422	0.6844	-0.7519	-1.3063	1.0495	1.1277	0															
OC5	-0.1523	0.5636	-1.0811	-0.3754	-1.9011	-0.3704	0.125	0.6196	-1.5544	1.4079	-0.2706	-0.8026	-0.6627	0														
OC4	0.4881	-1.8301	1.7026	-0.382	-2.1933	0.7929	-1.5404	-0.3961	0.7922	-0.3357	-2.3319	0.476	-1.0512	4.1153	0													
OC3	1.7886	-0.8229	-1.3439	-0.8504	0.5155	2.1285	0.7595	0.9013	-1.5618	-1.9114	-0.6395	-0.4476	-1.4854	1.175	3.0443	0												
OC2	0.7621	0.8015	-1.852	-1.8805	0.6427	2.5243	0.4476	1.1904	-3.1052	-1.3593	-3.1635	-0.5891	-2.0833	4.0122	4.7615	2.944	0											
TECH1	1.4361	0.204	-0.8683	0.889	-0.9016	2.7573	2.704	2.5662	-2.3697	-2.5379	0.9213	-0.3229	0.0051	-1.2302	-3.5143	0.8051	0.6233	0										
TECH2	1.5748	-0.2634	-1.3677	-0.2078	-0.8547	3.5493	0.5964	1.2927	-3.4123	-3.0429	-1.0718	-1.7566	-1.189	-1.5053	-1.8771	-0.077	1.6183	-0.0584	0									
TECH3	0.4134	0.3836	-1.8198	-0.1662	-1.8473	4.0017	2.0729	1.464	-3.9952	-1.9026	-1.5902	-0.3927	0.5158	2.8855	0.1186	0.1865	6.5059	-0.4327	0.679	0								
PPS1	-0.5417	-0.6717	-1.5289	0.7512	0.0194	0.7866	-0.1174	-0.4239	-1.5949	1.211	1.8498	-0.2621	1.5287	0.9482	-2.9034	-1.1294	-0.6199	0.355	0.9863	-0.3407	0							
PPS2	-0.7879	0.3277	0.1922	-1.0218	0.0915	0.8502	-0.6424	-1.205	-0.8273	-0.183	-2.1963	-1.8595	-0.3366	0.0711	-1.7726	-2.1787	-0.2018	-1.3107	-1.1063	-0.8777	0.2448	0						
PPS3	-1.8528	-1.06	1.1113	0.5084	-1.6927	-0.3015	-0.6285	-0.8673	-0.5044	0.9024	1.7554	-0.6307	-0.1134	-1.3626	-3.4384	-2.4158	-3.0261	-0.5266	-0.6449	-2.9366	1.5139	0.7523	0					
PPS4	0.9191	-0.0141	0.2735	2.3681	-1.2329	1.0049	2.9932	1.3693	-0.6123	1.5256	1.0668	0.8599	3.47	2.2162	-0.4817	0.0692	1.2019	2.0892	-0.3233	1.7055	-0.4086	0.2241	-1.0699	0				
HRC2	2.6646	2.5439	-0.8384	-1.1783	1.2451	2.4449	1.2373	-1.2438	-2.1097	-4.746	-1.8497	-2.5293	-1.8083	-4.7839	-4.4926	0.0209	-1.7774	0.0261	-0.2722	-2.4184	-1.2264	-1.1487	-1.5014	-2.9271	0			
HRC3	0.9637	2.3712	-0.816	2.4956	-0.4326	-1.055	0.8424	-0.784	-2.0232	-0.9673	1.7822	0.0859	0.7524	-2.5699	-4.6322	-0.417	-1.7958	0.4858	0.1625	-2.2142	0.0394	-0.3128	1.0624	0.9344	-0.1314	0		
HRC4	1.9168	-0.1815	-0.1944	0.154	-0.0847	1.5318	1.9495	-0.4903	-0.8222	-4.2649	-0.4497	-0.0422	-0.3284	-4.4166	-3.4978	-2.0828	-4.0146	-1.1689	-0.6263	-2.7134	-2.572	-1.5094	-0.1241	-2.3451	2.0024	1.671	0	
HRC5	2.3985	1.4903	0.8097	1.7063	-0.2343	3.7287	3.5929	0.9344	-1.1712	-1.4063	0.1536	-0.0836	0.7052	-0.5639	-1.665	0.9464	2.7183	1.0936	1.8566	2.5133	0.1272	-0.1433	-0.8413	1.0956	-0.7601	-0.2871	-0.4491	0

Table 4.11
Root Mean Square Residual (RMR) of Latent Variables

Construct	**RMR**
Human Resource Capability	0.0213
Planning Production System	0.0101
Technology	0.0000
Organizational Culture	0.0371
Organizational Performance	0.0317

RMR is generally used to detect the distribution of research data. Variables' RMR below 0.05 indicates normal distribution. These results in Table 4.11 indicate that all RMR values are below 0.05, meaning that the research data follows a normal distribution. The smallest RMR is for TECH at 0.0000, and the largest is for OC at 0.0371.

4.3 Profile of Respondents

4.3.1 Response Rate

In compliance with data collection requirements, 370 questionnaires were personally distributed to all SMEs in the metals/automotive sector of West Java, as detailed in chapter three table 3.1 page 79.

4.3.2 Demographic Distribution of the Respondents

The characteristics of respondents were analysed using frequency distribution, as presented in Table 4.12 and described in the following sub-sections.

Table 4.12
Organization Profile of Respondents

	Category	Frequency	Percent
Work Location	Bandung City	120	33.33%
	Bandung Regency	40	11.11%
	Bandung Barat Regency	40	11.11%
	Cimahi City	40	11.11%
	Karawang Regency	60	16.68%
	Bekasi Regency	30	8.33%
	Bekasi City	30	8.33%
	TOTAL	**360**	**100%**
Number of Employees	< 5	100	27.8%
	5 – 10	210	58.3%
	11 – 15	50	13.9%
	TOTAL	**360**	**100%**

The next subtopic was to classify the respondents according to the demographic variables such as work location and number of employees.

4.3.2.1 Profile of Respondents According to Region

According to region, profile of respondents SMEs automotive and metal sector in West Java can be illustrated this follows. The largest group of respondents are from Bandung City 120 respondents (33.33%), in detail numbers of respondents from Bandung Regency is 40 respondents (11.11%), from West Bandung Regency 40 respondents (11.11%) and Cimahi City 40 respondents (11.11%). 60 respondents (16.68%) are from Karawang Regency, 30 respondents (8.33%) from Bekasi Regency, and 30 respondents (8.33%) from Bekasi City.

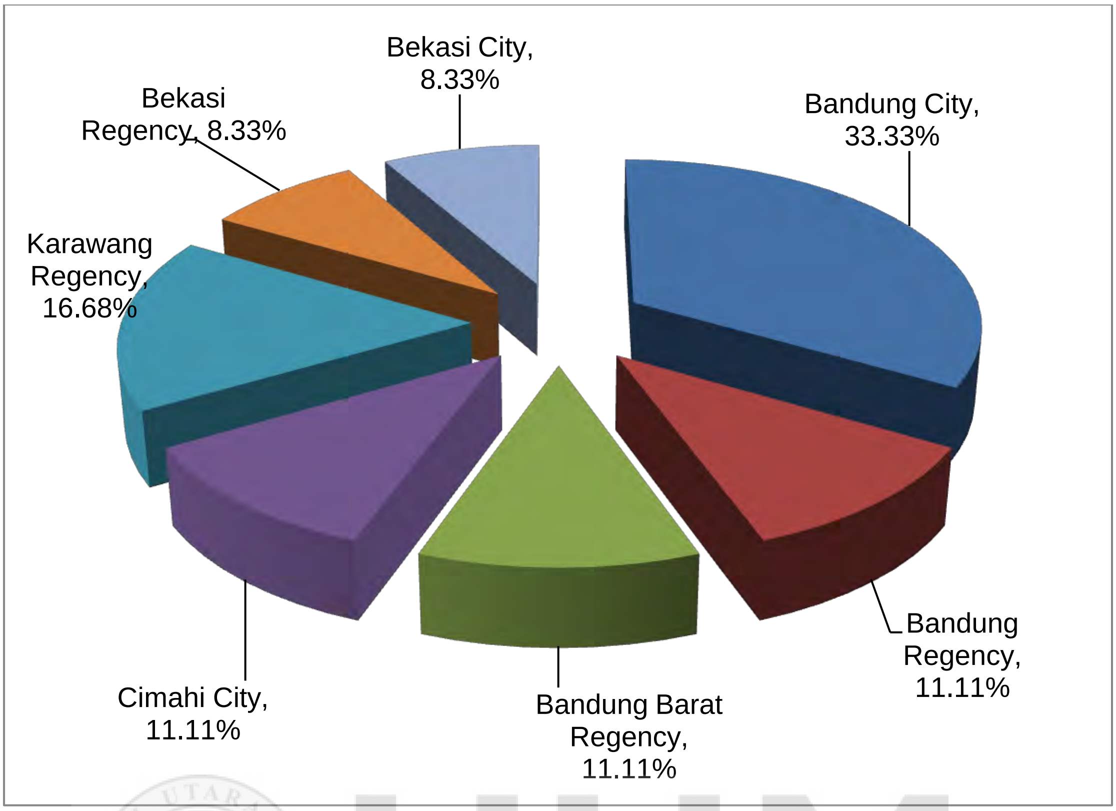

Figure 4.2
Distribution of Respondents According to Region

It is not surprising that most of our SMEs are located in Bandung, given that it is the capital of West Java province and has experienced the largest growth of SMEs in the region. Figure 4.2 shows details.

4.3.2.2 Profile of Respondents According to Number of Employees

Based on data collection, this study provides an overview of respondents SMEs automotive and metal sector in West Java according to the number of workers. Well over half (58.3%) of our SMEs have 5-10 employees, with 27.8 % having fewer than 5and 13.9% over 10. Figure 4.3 shows details.

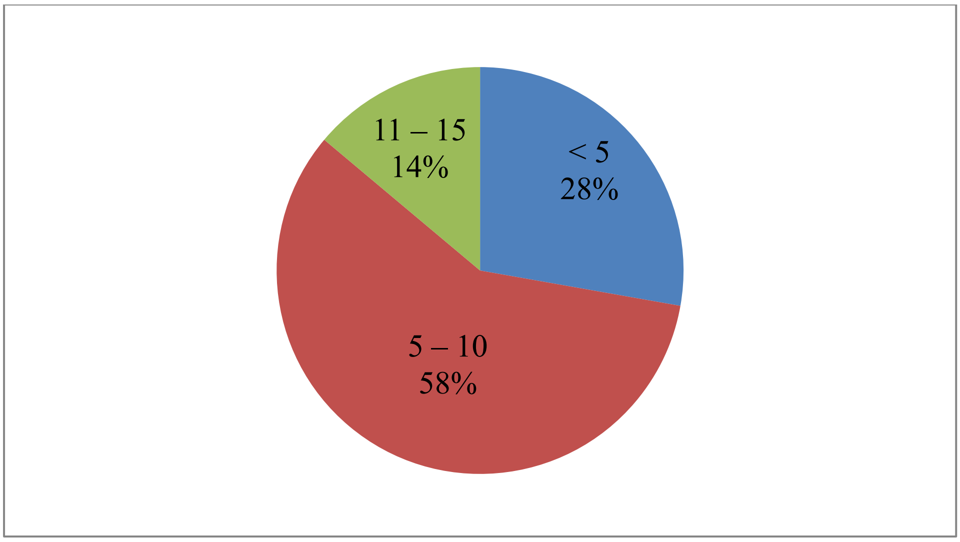

Figure 4.3
Distribution of Respondents According to Number of Employees

4.4 Confirmatory Factor Analysis (CFA)

Structural Equation Modelling (SEM) is a useful technique available in AMOS for testing CFA, especially for models which have multiple variables and to examine the interrelationships between them (Hair, Black, Babin, Anderson, & Tatham, 2006). The main purpose of conducting CFA is to confirm the factor loadings for each construct: HRC, PPS, TECH, and OC as a mediating variable.

Hair *et al.* (2006) provide lucid guidelines on the interpretation of factor loading values. A value of +0.50 or more is considered to be very significant; +0.40 is very important; and +0.30 is significant. In this research, all items had factor loadings of more than 0.70, indicating that they are correlated very significantly with the factor itself.

4.4.1 CFA of Independent Variable

For simplicity, a separate CFA for independent and dependent variables is performed to test the measurement properties of the underlying latent structure of measurement. The finding also analyses the convergent and discriminant validities of all the measures.

4.4.1.1 CFA of HRC

The CFA of the HRC variable is shown in Table 4.13. The factor loading for every item is satisfactory, with values ranging from 0.79 to 0.96, which is confirmed as acceptable by Hair *et al*., (2006). That is, all constructs meet the construct validity criterion. The number of items for each construct variables HRC1 (Skill), HRC2 (Innovation), HRC3 (Effectiveness), HRC4 (Training), and HRC5 (Commitment).

Table 4.13 shows that the dimension with the largest standardized payload is HRC1 at 0.9151. In other words, HRC1 can predict 83.74% of the latent HRC variables; the remaining 16.26% is a measurement error caused by other factors. The smallest standard charge is HRC5, amounting to 0.6149, and meaning that can predict 37.81%, while the remaining 62.19% is an error that comes from factors beyond the research. A critical view of the results in Table 4.13 has shown that the larger percentage of the items are above the 0.50 cut-off criterion, with the majority being above 0.60. This shows that the hypothesized items truly have a strong effect with the conceptualized model (Hair et al., 2006).

Table 4.13
Factor Loading of Human Resource Capability (CFA)

Construct	Code	Factor Loading
Skilled Human Resource	HRC1	0.9151
Innovative Human Resource	HRC2	0.8119
Effective Human Resource	HRC3	0.7344
Training Human Resource	HRC4	0.6710
Human Resource Commitment	HRC5	0.6149

Several indices were used to determine the goodness of fit of the exogenous model, as shown in Table 4.14. (e.g. GFI = 0.9616, AGFI = 0.8849, Ratio = 7.3209, TLI = 0.9280, CFI = 0.9640, and RMSEA = 0.1327). From these indices, it can be said that the model achieved a good fit for the data (Hair *et al.*, 2010).

Table 4.14
Goodness of fit of Human Resource Capability

Measures	Fit Indicates	Threshold Values	Source
GFI	0.9616	> 0.80	Hair *et al.* (2010)
AGFI	0.8849	> 0.80	Cuttance (1987)
Ratio	4.7209	< 5.00	Marsh and Hocevar (1985)
CFI	0.9640	> 0.90	Bentler (1990)
TLI	0.9280	> 0.90	Hair *et al.* (2010)
RMSEA	0.0727	< 0.08	Byrne (2010)

Note: GFI is the Goodness of Fit Index; AGFI is the Adjusted Goodness of Fit Index; CFI is the Comparative Fit Index; TLI is the Tucker-Lewis Index RMSEA is the Root Mean Square Error of Approximation.

HRC as predicted by the five variable constructs with coding items HRC1-HRC5 has a GFI suitability index greater than AGFI's 0.8, or even CFI and TLI's 0.9, all of which are still good models. If the views of the value ratio and RMSEA, in the case of discrepancy as measured by the index ratio which has a value < 5 and less than RMSEA index of 0.08, this indicates the model is very suitable. Overall, CFA models for HRC latent variables predicted HRC1–HRC5 is very good.

4.4.1.2 CFA of PPS

Similarly, CFA was conducted on the PPS independent variable. The results in Table 4.15 indicate that factor loadings of the variable constructs of PPS, ranging from 0.7158 to 0.8452, achieved the minimum cut-off value as suggested by Hair *et al.* (2006). Therefore, it can be said that all constructs meet the construct validity criterion. The residual number of items of each variable construct was as follows: production planning (PPS1), location of production (PPS2), factory location (PPS3), workplace (PPS4) and working standard (PPS5).

Table 4.15
Factor Loading of Planning Production System (CFA)

Construct	**Code**	**Factor Loading**
Production Planning	PPS1	0.8452
Location of Production Facilities Planning	PPS2	0.8358
Factory Location Planning	PPS3	0.7158
Workplace Planning	PPS4	0.7438
Planning Working Standard	PPS5	0.7571

This table explains that the variable construct with the greatest standardized payload is PPS1 at 0.8452; in other words, PPS1 can predict PPS latent variables of 71.44% (0.8452^2 x 100%); the remaining 28.56% is a measurement error caused by other factors. The dimension which has the smallest standard charge is PPS3 at 0.7158, which means being able to predict variable PPS at 51.23% (0.7158^2 x 100%), while the remaining 48.77% is a mistake that comes from factors beyond the research. The results in Table 4.15 has shown that the larger percentage of the items are above the 0.50 cut-off criterion, with the majority being above 0.60. This shows that the hypothesized items truly have a strong effect with the conceptualized model (Hair et al., 2006).

Table 4.16 shows that the goodness of fit of PPS predicted by the five variable constructs PPS1-PPS5 has a GFI suitability index larger than AGFI's 0.8, or CFI and TLI's 0.9, nevertheless indicating comparatively good models. Likewise with the discrepancy index, as the ratio of the value of the result is less than 5, the model is accepted. Similar to the RMSEA value with index less than 0.08, this indicates that the model is very suitable. Overall, therefore, CFA models for PPS latent variables predicted PPS1-PPS5.

Table 4.16
Goodness of fit of Planning Production System

Measures	**Fit Indicates**	**Threshold Values**	**Source**
GFI	0.9776	> 0.80	Hair *et al.* (2010)
AGFI	0.9328	> 0.80	Cuttance (1987)
Ratio	3.9365	< 5.00	Marsh and Hocevar (1985)
CFI	0.9843	> 0.90	Bentler (1990)
TLI	0.9686	> 0.90	Hair *et al.* (2010)
RMSEA	0.0781	< 0.08	Byrne (2010)

4.4.1.3 CFA of TECH

CFA was also conducted on the TECH independent variable. Table 4.17 shows that the construct with the greatest standardized payload is TECH2 at 0.8747; in other words, TECH2 can predict latent variable TECH with 76.51% (0.8747^2 x 100%) probability; the remaining 23.49% is a measurement error caused by other factors. The construct with the smallest standard charge is TECH3 at 0.7426, with prediction of 55.14% (0.7426^2 x 100%); the remaining 44.86% is a mistake that comes from factors beyond the research.

Table 4.17
Factor Loading of Technology (CFA)

Construct	**Code**	**Factor Loading**
Technical Science	TECH1	0.8391
Level of Skill	TECH2	0.8747
Physical Tools	TECH3	0.7426

In Table 4.18 TECH is predicted by three dimensions: it has GFI and CFI with a perfect match of 1; and the discrepancy index is zero, that is less than 5, so the model is acceptable. Similarly, the index is less than RMSEA's 0.08, indicating a very suitable model. Overall, therefore, CFA models for the latent variable TECH as predicted byTECH1-TECH3 is otherwise excellent.

Table 4.18
Goodness of fit of Technology

Measures	Fit Indicates	Threshold Values	Source
GFI	1.0000	> 0.80	Hair *et al.* (2010)
AGFI	0.9786	> 0.8	Cuttance (1987)
Ratio	0.0000	< 5.00	Marsh and Hocevar (1985)
CFI	1.0000	> 0.90	Bentler (1990)
TLI	0.9986	> 0.90	Hair *et al.* (2010)
RMSEA	0.0682	< 0.08	Byrne (2010)

4.4.1.4 CFA of OC

The result of CFA on the mediating variable OC, in Table 4.19, show that the indicator with the largest standardized payload is OC7, at 0.7574. This means that it can predict latent variables OC at 57.37% (0.7574^2 x 100%); the remaining 42.63% is a measurement error caused by other factors. The indicator with the smallest standard charge is OC1 at 0.5844, able to predict OC only at 34.15% (0.5844^2 x 100%); the remaining 65.85% is a mistake that comes from factors beyond the research.

Table 4.19
Factor Loading of Organizational Culture (CFA)

Construct	Code	Factor Loading
Organizational Culture	OC1	0.5844
	OC2	0.6991
	OC3	0.6771
	OC4	0.6830
	OC5	0,6506
	OC6	0.7517
	OC7	0.7574
	OC8	0.7177

Table 4.20
Goodness of fit of Organizational Culture

Measures	**Fit Indicates**	**Threshold Values**	**Source**
GFI	0.9476	> 0.8	Hair *et al.* (2010)
AGFI	0.9057	> 0.80	Cuttance (1987)
Ratio	3.7858	< 5.00	Marsh and Hocevar (1985)
CFI	0.9525	> 0.90	Bentler (1990)
TLI	0.9335	> 0.90	Hair *et al.* (2010)
RMSEA	0.0781	< 0.08	Byrne (2001)

According to Table 4.20, OC predicted by the eight indicators OC1-OC8 have a GFI suitability index larger than the 0.8 of or the 0.9 of CFI and TLI, indicating comparatively good models. Likewise, the discrepancy index is less than 5, indicating that the model is accepted. Similarly, the index is still less than RMSEA's 0.08, indicating a very suitable model. Overall, CFA models for latent variable OC predicted by OC1-OC8 are otherwise excellent.

4.4.1.5 CFA of OP

The results of CFA on the dependent variable OP are shown in Table 4.21. The indicator with the greatest standardized payload is OP4, amounting to 0.8124, and meaning that OP4 can predict latent variable OP by 66.00% (0.8124^2 x 100%); the remaining 34.00% is a measurement error caused by other factors. The indicator with the smallest standard charge is OP7 at 0.5859, able to predict OP by only 34.33% (0.5859^2 x 100%); while most of the remaining 65.67% is a mistake that comes from factors beyond the research.

Table 4.21
Factor Loading of Organizational Performance (CFA)

Construct	Code	Factor Loading
Organizational Performance	OP1	0.7518
	OP2	0.7552
	OP3	0.7700
	OP4	0.8124
	OP5	0.6413
	OP6	0.6273
	OP7	0.5859

Table 4.22 on goodness of fit of OP predicted by the seven indicators OP1-OP7 has a compatibility index from GFI which is greater than AGFI's 0.8, and CFI and TLI's 0.9, indicating comparatively good models. Measurement goodness of fit of Organizational Performance had acceptable fit to the data, the ratio was equal to 3.465 which indicated a significant, and other values; GFI = 0.9637, AGFI = 0.9274, CFI = 0.9679, TLI = 0.9519, and RMSEA = 0.0782, also achieved the recommended values to ensure the goodness of fit.

Table 4.22
Goodness of fit of Organizational Performance

Measures	Fit Indicates	Threshold Values	Source
GFI	0.9637	> 0.80	Hair *et al.* (2010)
AGFI	0.9274	> 0.80	Cuttance (1987)
Ratio	3.4650	< 5.00	Marsh and Hocevar (1985)
CFI	0.9679	> 0.90	Bentler (1990)
TLI	0.9519	> 0.90	Hair *et al.* (2010)
RMSEA	0.0729	< 0.08	Byrne (2010)

The discrepancy index is less than 5.00, indicating the model is accepted, similarly the index is still less than RMSEA's 0.08 which indicates very suitable models. Overall, CFA models for the latent variables OP predicted by OP1-OP7 are otherwise excellent.

4.5 Generated Model

In this study, CFA was conducted for each variable separately. Therefore, it could be possible that when they all variables were placed together in SR (Structural Regression) model, their indicators might show high correlations or cross loadings with other variables. Hence, it was decided to mitigate this threat by conducting CFA for full measurement model, i.e., with measures of all the variables of this study together. The results of CFA demonstrated the full measurement model with measures of all the variables had acceptable fit to the data, the ratio was equal to 2.865 which indicated a significant, and other values; GFI = 0.866, AGFI = 0.834, CFI = 0.914, TLI = 0.901, and RMSEA = 0.068, also achieved the recommended values to ensure the goodness of fit (see Table 4.23).

Table 4.23
Goodness of fit of full measurement model of the study

Measures	**Fit Indicates**	**Threshold Values**	**Source**
GFI	0.866	> 0.80	Hair *et al.* (2010)
AGFI	0.834	> 0.80	Cuttance (1987)
Ratio	2.865	< 5.00	Marsh and Hocevar (1985)
CFI	0.914	> 0.90	Bentler (1990)
TLI	0.901	> 0.90	Hair *et al.* (2010)
RMSEA	0.068	< 0.08	Byrne (2010)

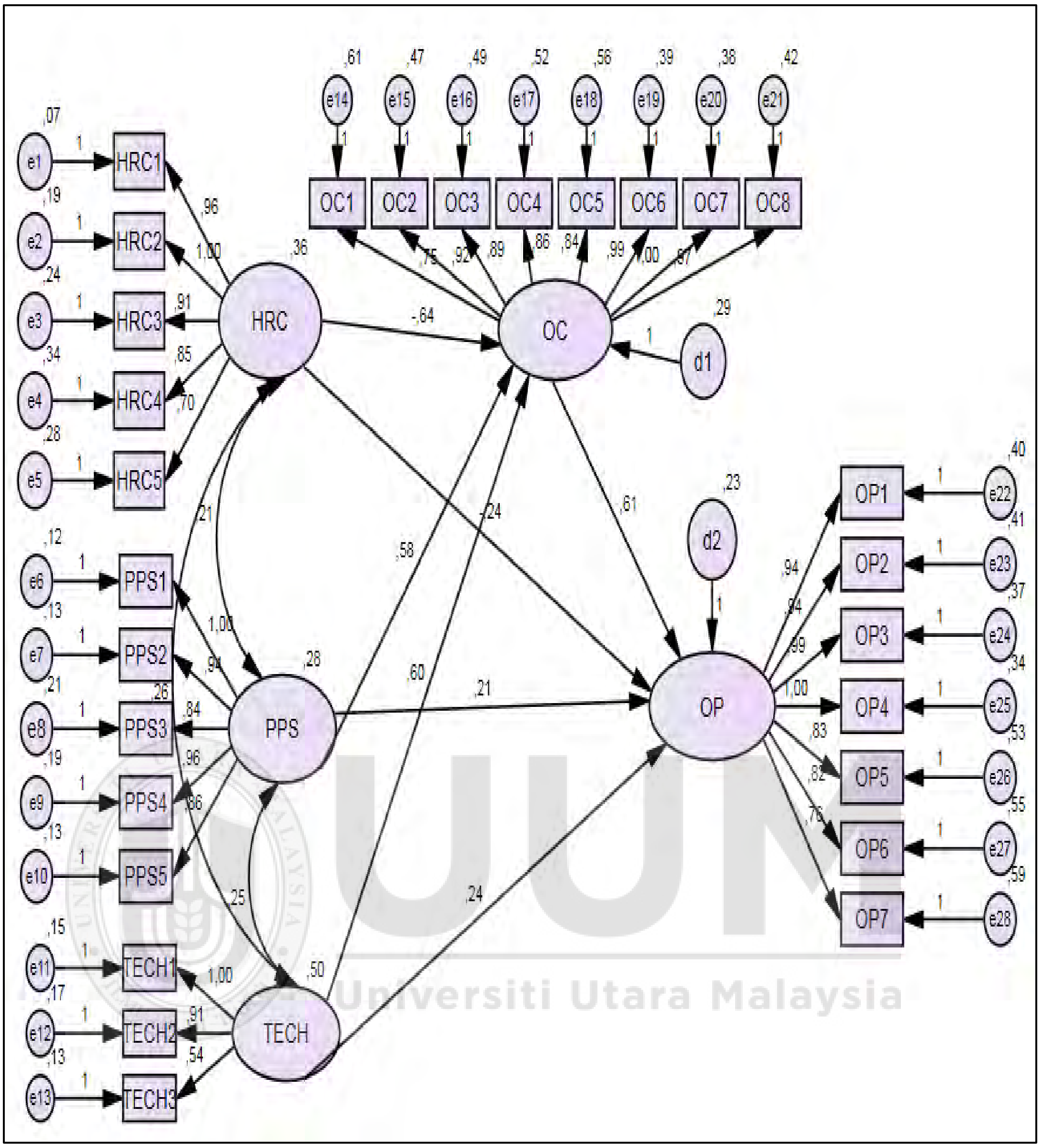

Figure 4.4
Generated Model for the Variables

Figure 4.4 about generated model for the variables shows the structural model. The first structural model is the effect of HRC, PPS and TECH on OC can be written as:

$$Y (\beta) = OC = \gamma_{11} \ HRC + \gamma_{12} PPS + \gamma_{13} TECH + \xi_1$$

Structural model of the second part is the influence of HRC, PPS, TECH and OC on OP through organization culture with formulation as follows:

$$OP = \gamma_{21} HRC + \gamma_{22} PPS + \gamma_{23} TECH + \beta OC + \xi_2$$

Both structural models show the effect of HRC, PPS, TECH and OC either directly or indirectly on organization performance.

Table 24 *Squared Multiple Correlation Result*

Endogen	**Estimate SMC = (R^2)**
HRC1	0,835
HRC2	0,659
HRC3	0,551
HRC4	0,436
HRC5	0,384
PPS1	0,710
PPS2	0,651
PPS3	0,491
PPS4	0,583
PPS5	0,615
TECH1	0,773
TECH 2	0,712
TECH 3	0,525
OC1	0,328
OC2	0,493
OC3	0,465
OC4	0,432
OC5	0,401
OC6	0,570
OC7	0,584
OC8	0,546
OP1	0,560
OP2	0,553
OP3	0,606
OP4	0,629
OP5	0,426
OP6	0,413
OP7	0,361

Based on the value of the coefficient of determination in Table 4.24, shows that which contributes the greatest influence on HRC latent variable is HRC1 dimension of 83.5%. In PPS measurement model, the most dominant dimension is PPS1 dimension with contribution value of influence equal to 71,0%, meanwhile TECH measurement model, dimension which give contribution biggest influence is TECH1 (77,3%). In the OC and OP measurement models, the most dominant indicators in predicting the latent variables are OC7 (58.4%) and OP4 (62.9%), respectively.

4.6 Direct Hypothesis Results

This research aimed to test four direct (i.e HRC, PPS, TECH, and OC) and three indirect (i.e HRC, PPS, and TECH) hypotheses concerning relationships between the independent, mediating and dependent variables.

However, in order to test the hypotheses directly, regression tables were extracted from the structural models. Interestingly, the results support all hypotheses. The factor loadings of the full measurement model shown in Table 4.25.

Table 4.25

Factor Loadings of full measurement model of the study

			Estimate SMC = (R^2)
HRC5	←	HRC	.618
HRC3	←	HRC	.719
HRC2	←	HRC	.818
PPS4	←	PPS	.776
PPS3	←	PPS	.633
PPS2	←	PPS	.791
PPS5	←	PPS	.808
TECH1	←	TECH	.883
TECH2	←	TECH	.840
TECH3	←	TECH	.723
OC1	←	OC	.562
OC2	←	OC	.672
OC5	←	OC	.611
OC6	←	OC	.764
OC7	←	OC	.778
OC8	←	OC	.762
OP1	←	OP	.772
OP2	←	OP	.737
OP4	←	OP	.766
OP5	←	OP	.675
OP6	←	OP	.647
OP7	←	OP	.605
HRC1	←	HRC	.918
OC3	←	OC	.628
PPS1	←	PPS	.816

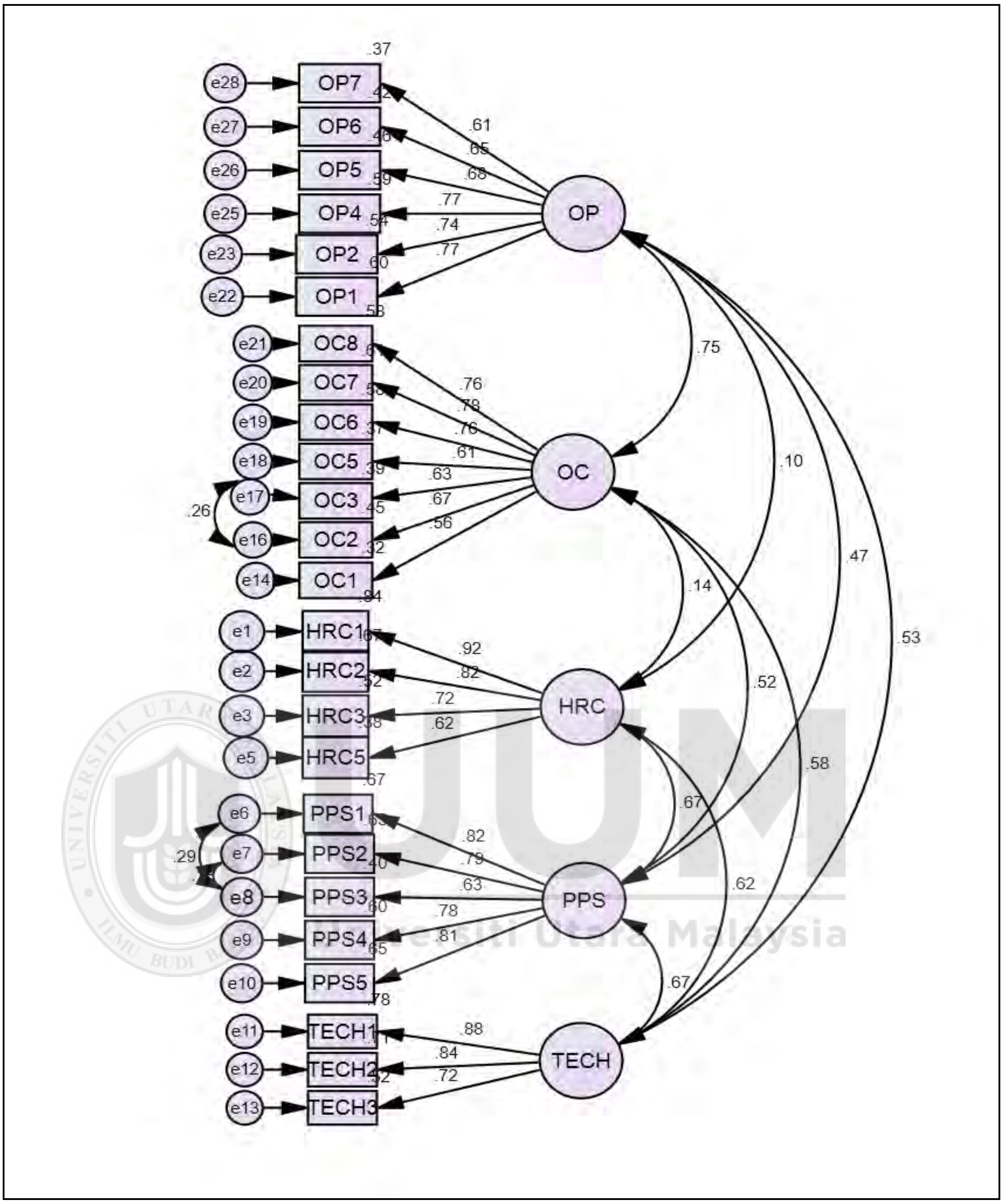

Figure 4.5
Overall Model CFA

Hypotheses Testing in Structural Regression (SR) Model

Unlike majority of studies which opted structural equation modeling (SEM) only for CFA and then tested the hypotheses in multiple regression analysis, this study used SEM for testing all the hypotheses through structural regression (SR) models. The biggest advantage of testing hypothesis through SR models (in SEM) than through multiple regressions analysis is, SEM has the ability to address the presence of measurement error within a statistical model while regression analysis does not.

Figure 4.6 provided a view to the full SR model with all the proposed relationships, including control variables.

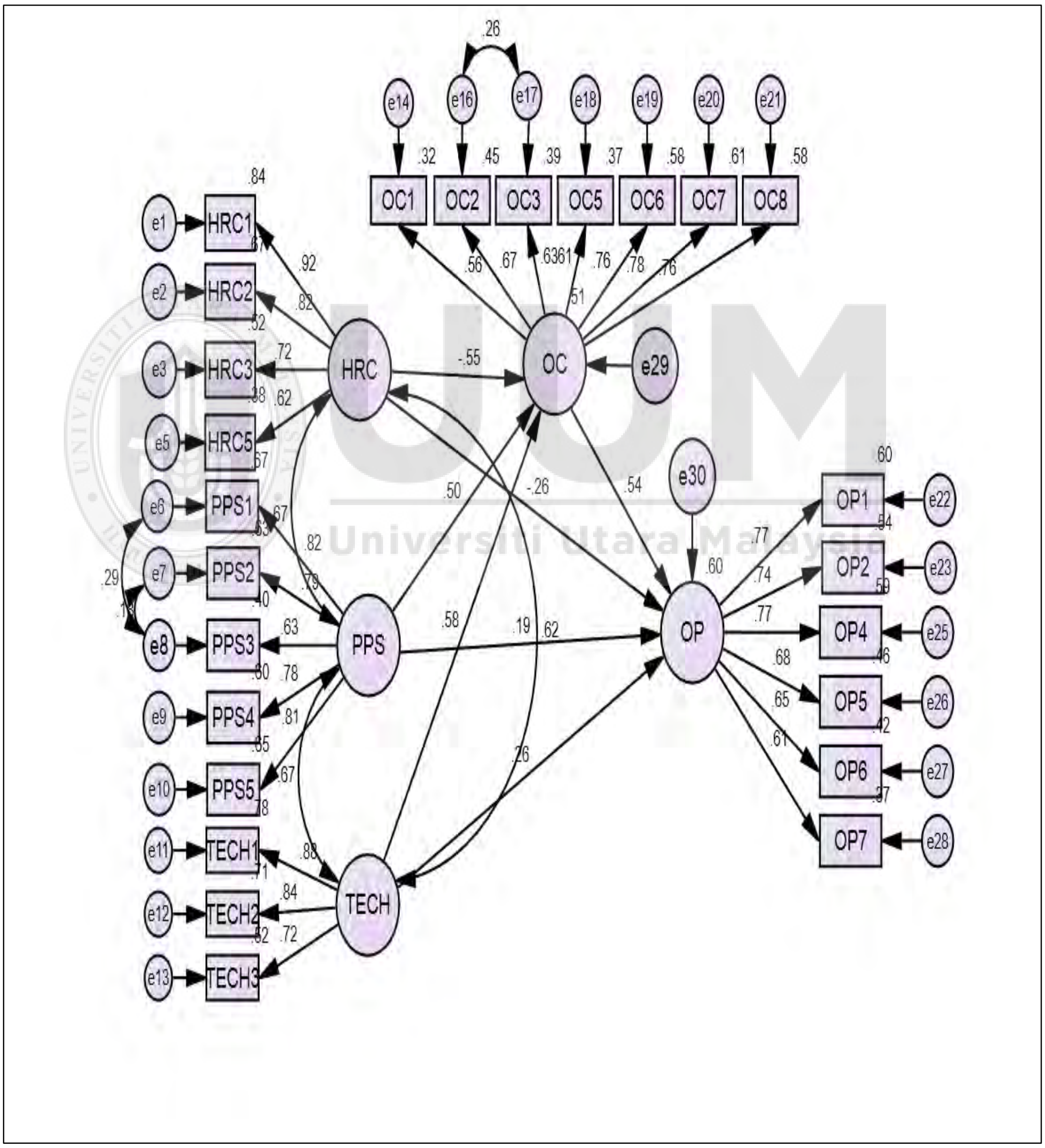

Figure 4.6
Baseline Full SR model with all the proposed relationship of the study

Researcher ran the baseline SR model for overall model with 5000 bootstrapping with all the hypothesized relationships as shown in Figure 4.6, and noted that fit indices of SR model is same as that of the measurement model (see Model 1 in Table 4.25).

Table 4.26 shows the results of for the direct hypotheses, tested by AMOS using boot strapping at 5000. The table demonstrates that HRC has a significant effect on OP (unstandardized β = -0.312; S.E = 0.104; p = 0.003; and coefficient of determination = 0.600). Therefore, **H1** was supported. As do HRC, also PPS (unstandardized β = .283; S.E = 0.131; p = 0.031; coefficient of determination = 0.600) that mean **H3** was supported and TECH (unstandardized β = .266; S.E = .089; p = 0.003; coefficient of determination = 0.600) that mean **H5** was supported. The results of the impact of independent variables OC on OP indicate a significant effect (unstandardized β = .528; S.E = 0.081; p = 0.000; coefficient of determination = 0.600) that mean **H7** was supported.

The results of the impact of independent variables on OC indicate a significant effect of HRC on OC (unstandardized β = -.670; S.E = .100; p = 0.000; coefficient of determination = 0.512). Therefore, **H2** was supported. As do HRC, also PPS (unstandardized β = .752; S.E = .135; p = 0.000; coefficient of determination = 0.512) that mean **H4** was supported, and TECH (unstandardized β = .606; S.E = 0.086; p = 0.000; coefficient of determination = 0.512) that mean**H6** was supported. The detailed results are given in Table 4.26.

Table 4.26
Direct Hypothesis Testing Results

		Hypothesis	Estimates (β)	S.E	P	R^2 Coefficient of determination	Result
H1	HRC → OP	Human resource capability has an effect on organizational performance	-.312	.104	0.003	0.600	Supported
H2	HRC → OC	Human resource capability has an effect on organizational culture	-.670	.100	0.000	0.512	Supported
H3	PPS → OP	The production planning system has an effect on organizational performance	.283	.131	0.031	0.600	Supported
H4	PPS → OC	The production planning system has an effect on organizational culture	.752	.135	0.000	0.512	Supported
H5	TECH → OP	Technology has an effect on organizational performance	.266	.089	0.003	0.600	Supported
H6	TECH → OC	Technology has an effect on organizational culture	.606	.086	0.000	0.512	Supported
H7	OC → OP	Organizational culture has an effect on organizational performance	.528	.081	0.000	0.600	Supported

Note: $P < 0.05$

4.7 Mediating Effect of Organizational Culture of the General Model

Table 4.27 presents the analysis of mediation to assess of the influence of HRC, PPS and TECH on OP, either directly or indirectly, through the OC.

The analysis showed that OC mediates the effect between HRC and OP. The sum of result model was run with 5000 bootstrapping samples (Preacher and Hayes, 2008). The results (β = -0.354; SE = 0.093; p = 0.000), and based on the result, indicated that H8 was supported. The results show that an indirect effect of HRC on OP, further reflecting the negative mediating effect of OC between HRC and OP.

Table 4.27 *Effects of HRC, PPS and TECH on OP (Mediator: OC)*

	OP					Result
	P.E	S.E	BC 95% CI Lower	BC 95% CI Upper	p	
HRC						
Total Effects (c path)	-0.666	0.123	-0.920	-0.444	0.000	
Direct Effects (c' path)	-0.312	0.166	-0.555	-0.094	0.006	
Indirect Effects via OC (a & b paths)	-0.354	0.093	-0.577	-0.208	0.000	Supported
PPS						
Total Effects (c path)	0.681	0.147	0.427	1.003	0.000	
Direct Effects (c' path)	0.283	0.142	0.008	0.570	0.045	
Indirect Effects via OC (a & b paths)	0.397	0.112	0.226	0.678	0.000	Supported
TECH						
Total Effects (c path)	0.586	0.103	0.396	0.781	0.000	
Direct Effects (c' path)	0.266	0.112	0.036	0.475	0.028	
Indirect Effects via OC (a & b paths)	0.320	0.082	0.186	0.516	0.000	Supported

BC = Biased Corrected; CI = Confidence Intervals (for 5000 bootstrap samples); P.E = Point of Estimate

Note: $P < 0.05$

The results of OC as a mediation variable on the relationship between PPS and OP shows that there is an indirect effect (β = 0.397; SE = 0.112; p = 0.000), indicated that H9 was supported.. Mediation of OC in the relationship between TECH and OP shows that there an indirect effect of TECH on OP (β = 0.320; SE = 0.082; p = 0.000), indicated that H10 was supported.. The result of the mediation analysis shows that OC mediates the effect between HRC, PPS, TECH and OP significantly. Table 4.28 summarizes the results of the study, as reflected in the support for all ten hypotheses.

Table 4.28
Summary of Results

		Hypotheses	**Result**
H1	:	Human resource capability has an effect on organizational performance	Supported
H2	:	Human resource capability has an effect on organizational culture	Supported
H3	:	The production planning system has an effect on organizational performance	Supported
H4	:	The production planning system has an effect on organizational culture	Supported
H5	:	Technology has an effect on organizational performance	Supported
H6	:	Technology has an effect on organizational culture	Supported
H7	:	Organizational culture has a mediating effect between human resources and organizational performance.	Supported
H8	:	Organizational culture has a mediating effect between the production planning system and organizational performance.	Supported
H9	:	Organizational culture has a mediating effect between technology and organizational performance.	Supported
H10	:	Organizational culture has an effect on organizational performance	Supported

4.8 Summary

This chapter has discussed the results of this research. A good response rate was gained from the respondents. CFA was conducted to ensure the construct validity of all variables, and reliability tests to determine the internal consistency between items and minimize random errors. Discriminant validity indicated a good measure for all remaining items. The chapter also presents the final structural models and the direct hypothesized results between variables. Finally, mediation results are given in general, supporting most of the hypotheses. These results are discussed in greater detail in the final chapter.

CHAPTER FIVE
DISCUSSION AND CONCLUSIONS

5.1 Introduction

This is the last chapter recapitulates the overview of the research. The chapter is structured into eleven sections in an attempt to summarize the whole study. Section 5.1 discusse introduction. This is followed by section 5. 2 Summary of the factor loading (CFA) Result. Section 5.3 Conclusion on hypothesis findings, thi section explains the direct significant factor human resource capability affecting to organizational culture and organizational performance, explains the direct significant factor planning production system affecting to organizational culture and organizational performance, explains the direct significant factor technology affecting to organizational culture and organizational performance, explain organizational culture as a mediating effect between human resource capability, planning production system, and technology on organizational performance, explains the direct significant factor organizational culture affecting organizational performance (SMEs automotive and metal sectors in West Java). Section 5.4 discusses contribution of the study. Section 5.5 limitations of the study and recommendations for future research.

This chapter summarizes the results of research based on their research objectives, and includes recommendations for practice in the context of a competitive environment. It also seeks to identify the relevance of research findings with the literature, in the discussion of theoretical contributions. Recommendations for further research are suggested, using a research model to explore the types of organizations, sectors or other industries.

5.2 Summary of the factor loading (CFA) Result

Based on the CFA indicator, this study suggests that all the HRC indicators (skill, innovation, effectiveness, commitment and training) have an impact on OP, and that its involvement in developing business strategies is becoming increasingly important, especially in high-tech SMEs (Karami, 2004; Dyer and Reeves, 1995; Analoui, 1999a).

To recap, the CFA indicator suggested that PPS includes product planning, location of factory, factory layout, work environment, and production standards. The production planning variable in particular influences the performance of firms operating internationally, as found in previous studies. Good planning of production systems will be able to transform inputs into good outputs to achieve organizational goals and good OP (Schank and Abelson, 2013; Simons, 2013). PPS clearly plays an important role in giving competitive advantage to a firm.

Based on the CFA indicator, this study suggests that technology is not only the key to a prosperous modern organization (Al-Najjar, 2014) but also contributes to increased productivity and efficiency of the productive process, in turn making the adoption of technology more effective and efficient (Loydell, 2012; Khan, Masrek, & Nadzar, 2015; Pusparini & Wibisono, 2013). This clearly indicates technology plays an important role in improving SMEs.

Thus the indicators predict that the latent variable OC can affect OP (Sokro, 2012; Racelis, 2010; Fard, Asghar, Rostamy & Taghiloo, 2009; Mathew, Rose, 2008).

This finding is supported by GFI measurement; at 0.9476 with a threshold value of > 0.8, this indicates that the model has a good fit; AGFI at 0.9057 and > 0.8 indicates also indicates that fitness model overall is good; while CFI at 0.9525 and TLI at 0.9335, both with a threshold of > 0.9, indicate excellent agreement. The discrepancy index as measured by the ratio value of 3.7858 and a threshold value of < 5 indicates that the model can be well received. Once again, only the RMSEA value of 0.0781 exceeds the threshold value of < 0.08, indicating that the model is very suited to the co-variance matrix of the population, although the overall CFA model for the latent variable OC is expressed very well.

5.3 Conclusion on Hypothesis Findings

The following sub-sections review the support or otherwise of each hypothesis.

5.3.1 Human Resource Capability has an effect on Organizational Performance

Based on the above data analyses and findings, Hypothesis 1 is supported, as the effect of HRC on OP has a strong association. The direct hypothesis testing indicated significant results for all dimensions of HRC.

Specifically, all HRC indicators had a significant effect on OP. Skill (HRC1) had a significant effect indicated by index γ_{11} = 0.914, Cr. = 20.385, $p < 0.05$. Innovation (HRC2) had a significant effect indicated by index γ_{12} = 0.812, Cr. = - (not counted in the AMOS test, as the smallest value had earlier suggested the numbers fit), $p < 0.05$. Effectiveness (HRC3) had a significant effect indicated by index γ_{13} = 0.742, Cr. =15.316, $p < 0.05$. Commitment (HRC4) had a significant/supported effect indicated by index γ_{14} = 0.660, Cr. = 13.165, $p < 0.05$. Training (HRC5) had a significant effect indicated by index γ_{15} = 0619, Cr. = 12.269, $p < 0.05$. In addition, using bootstrapping, direct hypothesis testing calculated that HRC variables had a direct effect on OP variables, as seen from Estimates = -.241, S.E = .097, Cr. = -2.480 and value of P = 0.013 ($P < 0.05$); coefficients are supported. These findings indicate that the hypothesis that HRC has an effect on OP is proved.

Therefore, based on a test for the direct effect of HRC on OP, direct effect is supported. These results are in accordance with previous studies showing that HRC has a direct effect on OP (Wibisono, 2011; Aprilyani, 2006; Amabile, 1997; Karami, 2004; Dyer & Reeves, 1995; Analoui, 1999a).

Additionally, as possible explanation for significant effect between Human Resource Capability on Organizational Performance, might be because Human Resource Capability (Skill, Innovation, Effectiveness, Commitment, and Training) was regarded as a motivating factor for increasing Performance SME's in West Java (Wibisono, 2011; Aprilyani, 2006; Amabile, 1997; Karami, 2004), that when Human Resource Capability is linked with organizational culture significant effect increase the competitiveness and also can escalates the performance SME's.

5.3.2 Human Resource Capability has an effect on Organizational Culture

Hypothesis 2 is supported.

Testing obtained a Cr. value of -6.655 (P = 0.000), while the critical limit for the 5% significance level was 1.96. Thus, there is a significant effect of HRC on OC, and the amount of influence is $(-0529)^2 \times 100\% = 27.98\%$. Calculation of the direct effect of

HRC on OC also supports the hypothesis, as can be seen from Estimates = -.643, S.E = .097, where Cr. = -6.655 and the P value is an indicator of 0.000 ($P < 0.05$).

These results in line with those of Gerhart (2009), who noted that employees in a given environment will perceive strong feelings of support from the organization to which they belong, which will motivate them to make further contributions on behalf of that organization. In this context, Enkel et al., (2012) stated that the efficacy of human resources is an organizational-level efficacy that attracts human talent as well as enhancing employees' motivation. Similarly, Barbosa (2014) reported that human resource practices support a culture of creativity and innovation in employees and are essential for the company to achieve success and develop a sustainable competitive advantage. Furthermore, Human Resource Capability plus unique cultural traits can be a source of competitive advantage. This means that Human Resource Capability has an impact on culture, making it more competitive and helping to achieve better OP.

Moreover, as possible explanation for significant effect between Human Resource Capability on Organizational Culture, might be because Human Resource Capability as a dominant factor for improvement organizational culture (Enkel et al., 2012, Barbosa, 2014), so that Human Resource Capability is mediated by organizational culture significantly effect can be increased the organization competitiveness and also escalates the performance SME's.

5.3.3 The Production Planning System has an effect on Organizational Performance

Hypothesis 3 is supported.

A strong association with OP can be seen from the direct hypothesis testing, which was significant for all PPS item/indicators.

All these planning variables had a significant effect on OP, indicated as follows. Product planning's (PPS1) significant effect is indicated by index γ_{21}= 0.843, CR=- (not counted again in the AMOS test; the smallest value had earlier suggested the numbers fit), $p < 0.05$; factory location (PPS2) by index γ_{22} = 0.807, CR =17.917, $p < 0.05$; factory layout (PPS3) by index γ_{23} = 0.701, CR =14.933, $p < 0.05$; work environment (PPS4) by index γ_{24} = 0.764, CR = 16.247, $p < 0.05$; and production standards (PPS5) by index γ_{25} = 0.784, CR = 16.778, $p < 0.05$. The results of testing hypothesis 2 is Cr. values obtained for 1.994 (P = 0.046), while the critical limit for the 5% significance level was 1.96. Thus the absolute value of Cr. at 1.96 is greater than P 0.05, a significant effect of PPS on OP: 0151^2 x 100% = 2.28%.

The effect of PPS on OP was also supported by the direct effect. That PPS variables will also affect OP variables is supported by Estimates = 0.214, S.E = .108, Cr. = 1.994 and P = 0.046 ($P < 0.05$). The coefficient supports and indicates that respective PPS variables were lead to improvements in OP.

These results are consistent with previous studies showing that had a supportive effect on OP (Cummings & Worley, 2014; Drees & Kummer, 2013; Heizer & Render, 2011;

Rolstadas, 2012; Heragu, 2006; Fetcho-Phillips, 2011; Nafukho, Graham, & Muyia, 2010; Sammito & Niebel, 2013).

Additionally, as possible explanation for significant effect between Production Planning System on Organizational Performance, might be because Production Planning System was regarded as a motivating factor for increasing Performance SME's in West Java (Cummings & Worley, 2014; Drees & Kummer, 2013; Heizer & Render, 2011; Rolstadas, 2012; Heragu, 2006; Fetcho-Phillips, 2011; Nafukho, Graham, & Muyia, 2010; Sammito & Niebel, 2013; Effendi, 2005, Biro Perencanaan, 2015) especially product planning's, factory location, factory layout, work environment, that when Production Planning System is linked with organizational culture significant effect increase the competitiveness and also can escalates the performance SME's.

5.3.4 The Production Planning System has an effect on Organizational Culture

Hypothesis 4 is supported.

The test resulted in a critical value ratio of 5.079 (P = 0.000), while the critical limit for the 5% significance level was 1.96. Thus the absolute value of Cr., 1.96, is greater than P 0.05, showing a significant influence of PPS on OC: $(0.422)^2 \times 100\% = 17.81\%$. This was supported by the direct effect of PPS variables on OC: Estimates = .580, S.E = .114, C.R = 5.079 with the P value as an indicator of 0.000 ($P < 0.05$).

These results are in line with the arguments presented by Hofstede (2001) and Schein (2004): OC, the ways of working through which an organization operates, including stories, traditions and belief systems commonly shared by the members of the organization to achieve objectives, while efficient PPS transforms inputs into finished goods, again helping the organization to achieve its objectives (Schank and Abelson, 2013; Simons, 2013). That is, PPS enables standard procedures and protocols developed as OC to achieve a common goal and objectives.

Moreover, as possible explanation for significant effect between Production Planning System on Organizational Culture, might be because Production Planning System as a dominant factor for improvement organizational culture (Schank and Abelson, 2013; Simons, 2013), so that Production Planning System is mediated by organizational culture significantly effect can be increased the organization competitiveness and also escalates the performance SME's.

5.3.5 Technology has an effect on Organizational Performance

Hypothesis 5 is supported.

This indicates that TECH has a sigificant influence on OP, a finding which bridges the existing gap in the literature.

The result from direct hypothesis testing indicated that all TECH indicators had a significant effect on OP: technical science indicated by index $\gamma_{31} = 0.879$, CR = -, $p < 0.05$; the by index $\gamma_{32} = 0.844$, CR = 15.285, (tests on the smallest value of the variable had earlier suggested the numbers fit), $p < 0.05$; and physical tools by index $\gamma_{33} = 0.725$, CR =18.771, $p < 0.05$. This was supported by calculations of the direct effect of TECH variables on OP: Estimates = -.238, S.E = .086, C.R = 2.763 and the P value as an indicator of 0.006 ($P < 0.05$).These results are in line with those of previous studies, showing that TECH had a significant effect on OP (Al-Najjar, 2014; Loydell, 2012; Chaplin et al., 2011; Dennis and Dowswell, 2013; Netland, 2013; Khan, Masrek, & Nadzar, 2015).

Additionally, as possible explanation for significant effect between Technology on Organizational Performance, might be because Technology was regarded as a motivating factor for increasing Performance SME's in West Java (Dennis and Dowswell, 2013; Netland, 2013; Khan, Masrek, & Nadzar, 2015), that when Technology is linked with organizational culture significant effect increase the competitiveness and also can escalates the performance SME's.

In this study, TECH showed the greatest direct effect on OP (0.006). The coefficient is supported and indicates that all TECH variables lead to improvements in OP.

5.3.6 Technology has an effect on Organizational Culture

Hypothesis 6 is supported.

C.R was 7.049 ($P = 0.000$), while the critical limit for the 5% significance level was 1.96. Thus the absolute value of Cr., 1.96, was greater than P 0.05, this showing a significant influence of TECH against OC. The magnitude of this effect is $(0.582)^2$x 100% = 33.87%. Further, the direct effect of TECH variables on OC is supported, as seen from the value Estimates = .603, S.E = .086, C.R = 7.049 and the P value as an indicator of 0.000 ($P < 0.05$).

These results are in line with those of Turner (2003), who argued that technology assistsin reinforcing the existing OC, with new technology systems determining overall effectiveness, because technology is crucial in contemporary socio-economic development. There is no doubt that technology can be a key to a prosperous society and successful nation (Al-Najjar, 2014).

Moreover, as possible explanation for significant effect between Technology on Organizational Culture, might be because Technology as a dominant factor for improvement organizational culture (Al-Najjar, 2014), so that Technology is mediated by organizational culture significantly effect can be increased the organization competitiveness and also escalates the performance SME's.

5.3.7 Organizational Culture has a mediating effect between Human Resource Capability (H7), the Production Planning System (H8) and Technology (H9) on Organizational Performance

Hypotheses 7, 8 and 9 are supported.

This indicates that OC partially mediates the relationships of HRC, PPS and TECH with OP, having a positive influence.

HRC variables had a significant effect, index = -0.64. The direct effect index for PPS was significant at 0.58; similarly TECH, at 0.60; the coefficient is supported which indicates that if the variable is held constant, it will lead to improvements in OP, by respectively 0.58, and 0.60 points.

The indirect effect of HRC variables on OC is supported; each variable was tested with respect to indicators Path Estimates (PE), Bootstrapping Confidence (BC), Confidence Interval (CI) lower and upper, and the P value as an indicator ($P < 0.05$). Based on the calculation results obtained total effect, the direct effects and the indirect effect by looking at the value of $P < 0.05$ as an indicator of whether or not a variable support.

The direct hypothesis testing results indicated that all items had a significant effect. OP1 had a significant effect indicated by index $\eta_1 = 0.843$, C.R = - (tests on the smallest value of the variable had earlier suggested the numbers fit), $p < 0.05$; OP2 by index $\eta_2 = 0.807$, C.R =17.917, $p < 0.05$; OP3 by index $\eta_3 = 0.701$, C.R =14.933, $p < 0.05$. OP4 by index $\eta_4 = 0.764$, C.R = - (tests on the smallest value of the variable had earlier suggested the numbers fit), $p < 0.05$; OP5 by index $\eta_5 = 0.784$, C.R = 16.778, $p < 0.05$; OP6 by index $\eta_6 = 0.784$, C.R = 16.778, $p < 0.05$; and OP7 by index $\eta_7 = 0.784$, C.R = 16.778, $p < 0.05$. These findings confirm the hypothesis of a mediator variable to independent and dependent variables calculating the total effect.

Hypothesis 7, based on the calculations shown in Table 4.26 shows a total effect of HRC with values PE = -0.666, BC 95%. CI lower = -0.920, CI upper = -0.444, and P value as an indicator = 0.000 ($P < 0.05$). Direct effects for HRC were calculated as PE = -0.312, BC 95% CI lower = -0.555 and CI upper = -0.094, and P value as indicator = 0.006 ($P < 0.05$). The indirect effect for HRC was PE = -0.354, BC 95%, CI lower = -0.577 and CI upper = -0.208, and the P value as indicator = 0.000 ($P < 0.05$). This means that there is a significant effect/support of the variable HRC against OC and OP through mediating variables.

Similarly, for Hypothesis 8 the results for the total effect for PPS were PE = 0.681, BC 95%, CI lower = 0.427, CI upper = 1.003, and P = 0.000 (P < 0.05). Direct effects for PPS were calculated as PE = 0.283, BC 95%, CI lower = 0.008, CI upper = 0.547, and P = 0.045 (P < 0.05). Indirect effects PPS were PE = 0.397, BC 95%, CI lower = 0.226, CI upper = 0.678, and P = 0.000 (P < 0.05). This means that there is a significant effect/support of the variable PPS against OC and OP through mediating variables.

Finally, the Hypothesis 9 results for TECH have values P. = 0.586, BC 95%, CI lower = 0.396, CI upper = 0.781, and P = 0.000 (P <0.05). Direct effects for TECH have values PE = 0.266, BC 95%, CI lower = 0.036 and CI upper = 0.475, and P value as an indicator = 0.028 (P <0.05). The indirect effect is PE = 0.320, BC 95%, CI lower = 0.186 and CI upper = 0.516, and the P value as an indicator = 0.000 (P < 0.05). This means that there is a significant effect/support of the TECH variable against OC and OP through mediating variables.

These findings show that all variables support increased OP variables, indicated by the total effect value of P = 0.000 for the HRC variable, 0.000 for PPS, and 0.000 for TECH.

Additionally, as possible explanation for significant effect between Human Resource Capability, production Planning System and Technology variables against Organizational Culture and Organizational Performance through mediating varibles, might be because Human Resource Capability, production Planning System and

Technology variables were regarded as a motivating factor for increasing Performance SME's in West Java (Cummings & Worley, 2014; Drees & Kummer, 2013; Heizer & Render, 2011; Rolstadas, 2012; Heragu, 2006; Fetcho-Phillips, 2011; Nafukho, Graham, & Muyia, 2010; Sammito & Niebel, 2013; Effendi, 2005, Biro Perencanaan, 2015; Dennis and Dowswell, 2013; Netland, 2013; Khan, Masrek, & Nadzar, 2015), that when Human Resource Capability, production Planning System and Technology variables are linked with organizational culture significant effect increase the competitiveness and also can escalates the performance SME's.

5.3.8 Organizational Culture has an effect on Organizational Performance

Hypothesis 10 is supported.

The results from direct hypothesis testing indicated that all OC items had a significant effect on OP: OC1 was indicated by index $\beta_1 = 0.573$, C.R = 10.743, $p < 0.05$; OC2 by index $\beta_2 = 0.702$, Cr. = 13.212, $p < 0.05$; OC3 by index $\beta_3 = 0.682$, C.R =12.784, $p < 0.05$; OC4 by index $\beta_4 = 0.657$, C.R = 12.332, $p < 0.05$; OC5 by index $\beta_5 = 0.633$, C.R = 11.862, $p < 0.05$; OC6 by index $\beta_6 = 0.755$, C.R = 14.593, $p < 0.05$; OC7 by index $\beta_7 = 0.784$, C.R = - (tests on the smallest value of the variable had earlier suggested the numbers fit), $p < 0.05$; and OC8 by index $\beta_8 = 0.739$, C.R = 14.290, $p < 0.05$. That is, based on a calculation of testing the OC variables on OP there is significant support for the indirect effect. OC variables will increase OP variables at 0.60.

The test results returned a C.R value of 7.831 (P = 0.000), while the critical limit for the 5% significance level was 1.96. Thus the absolute value of Cr., 1.96 was greater than $p < 0.05$, meaning that OC has a significant effect on OP, $(0585)^2 \times 100\%$ =

34.22%. Calculation of the direct effect of OC on OP is also supported, with Estimates = .607, SE = .077, C.R = 7.832 and the P value as an indicator of 0.000 ($P < 0.05$).

These results are in line with the findings of Poku, Owusu-Ansah and Zakari (2013), who asserted that OC is one of the elements around which a company can build competitive advantage, and which competitors may have difficulty in surmounting. OC has the potential to enhance not only OP, but also employee job satisfaction, and the sense of certainty about problem solving (Kotter, 2012). This implies that OC has a significant impact on OP.

Additionally, as possible explanation for significant effect between Organizational Culture on Organizational Performance, might be because Organizational Culture was regarded as a motivating factor for increasing Performance SME's in West Java (Poku, Owusu-Ansah and Zakari, 2013; Kotter, 2012), that when Organizational Culture is linked with organizational culture significant effect increase the competitiveness and also can escalates the performance SME's.

5.4 Contributions of the Study

This study has practical implications for the CEOs of SMEs. It is certainly the responsibility of top management to determine the best strategy in the face of today's competitive rivalry. Recognition of the importance of HRC, PPS and TECH can lead to perceiving opportunities and threats, equally for stakeholders. For example, if a company runs PPS without the support of good HCR and TECH developments this will definitely pose a major threat to OP, since the company's PPS cannot be implemented optimally.

The following sub-section discusses the theoretical of this research, practical contribution and outlines further economic contribution.

5.4.1 Theoretical Contribution

The present study's proposals are able to strengthen existing theory and provide better insight into the influence and relationship between certain tested variables. It also indicates similarities and differences with the findings of previous research.

This study shows that the performance of an organization is positively influenced by a specific combination of factors: strategic PPS, TECH and OC, both directly and indirectly. It further shows that OC plays a mediating role in the relationship of PPS and TECH with OP.

OC plays an important role and makes a positive contribution to OP, although HRC has a negative impact on OP. What is interesting is that, although with all its resources a company can still improve OP, it can be seen from their answers that respondent rate HRC items poorly but give high values to the OP statements.

The findings also support the belief that a specific combination of strategic HRC, PPS and TECH factors will improve OP. These results are in line with previous research studies, which agree that HRC, PPS and TECH lead to improved OP. Furthermore, the current findings indicate that RBV and DC assist in describing the relationship between HRC, PPS, and TECH and OP, directly or indirectly through OC.

5.4.2 Practical Contribution

This study offers information related to the management decision-making process. The results will assist top management in planning for better OP, especially in the context of HRC, PPS and implementation of TECH, and the OP variables.

Consideration of HRC, PPS and TECH, with appropriate planning to improve them, will strengthen competitiveness and OP. Application of these findings will not only improve the performance of players in the industry but give more confidence in making decisions vital to improving corporate performance. The study suggests important implications for practitioners in building and strengthening the competitive approach of their organization in the hyper-competitive environment, especially in the context of automotive and metal SMEs in West Java.

The results show that OC mediates the relationship between HRC, PPS, and TECH, playing a strategic role in determining OP. Integrating these strategic factors is very important if companies to be remain competitive.

5.4.3 Economic Contribution

This study highlights the performance of SMEs in the metal and automotive sector in West Java. HRC, PPS technology and Organizational culture have an active role in improving SMEs performance.

The results of this study can be used as a reference by Department of Industry and Trade West Java to achieve the objectives in enhancing the contribution of SMEs to GDP which is 40% Target on 2019. Increasing of SMEs performance and contribution to GDP will create jobs so that the problem can be resolved, especially for the region of West Java.

The results of this study can be encourage the development of SMEs which have global competitiveness, as the main target of the strategic plan of industry in West Java can be realized, total employment will increase the productivity; Number of companies / institutions will increase productivity; and Per capita income level of West Java Province and National increased also.

5.5 Limitations of the Study and Recommendations for Future Research

This study is limited to the automotive and metal sectors of West Java, for financial and time constraints. There was a single source of information from each company, and it is believed that these individuals are reliable and have the greatest knowledge of their HRC, PPS, and TECH and OP. Nevertheless, it would have been preferable to have more than one respondent from each company.

370 questionnaires directly (by hand) were completed, and 360 questionnaires were usable, giving an effective response rate of 97.30%, a sufficient number for optimal results in processing and data analysis, given the model of analysis used. This shows that the act of conducting surveys directly can be a good influence in filling out the questionnaire. However, time permitting; researchers could conduct interviews directly with corporate leaders if there is any suggestion of bias in the answers given.

It is worth pointing out that the results cannot be generalized to OP in countries other than Indonesia, because each nation has its own character and work culture. It is unfortunate that the findings are not necessarily generalizable to the manufacturing sector in developed countries.

A broader geographical coverage, with SMEs outside West Java, would focus on deeper dimensions and increase the accuracy of the results. This research was conducted using the survey method of a direct questionnaire. A quantitative approach might provide better results and understanding of the real situation of the strategic issues discussed in this study and their relationship with OP.

Specifically, this study examines the HRC, PPS, and TECH as determinants of OP. In future research, it is vital to expanding the predictor variables or focus even more on specific dimensions in each independent variable. It would be interesting to observe the relationship of competitive strategy, strategic flexibility and sourcing strategy with other strategic factors.

Future studies can consider other strong variables than might moderate or mediate the relationship between the factors and OP.

5.6 Conclusion

The results showed that 360 respondents in SMEs in the automotive and metals sector of West Java realize the importance of the strategic factors HRC, PPS and TECH within their organizations. Specifically, a good PPS with good HRC and the implementation of TECH, supported by other factors, will improve OP.

In particular, OC mediates the effect of HRC, PPS, TECH on OP and its impact. Directly and indirectly HRC, PPS and TECH significantly affect the performance of the organization; good planning and technology will result in better OP and enable competition globally, even for SMEs.

It is hoped that the research findings will help top management teams to develop and enhance the competitiveness of their companies competitive and improve OP. This will affect the future of our country, and the aim of making it one of the most competitive and developed by 2025 is within reach.

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Appendix A: Questionnaire

SCHOOL OF TECHNOLOGY, MANAGEMENT AND LOGISTIC
COLLEGE OF BUSINESS
UNIVERSITI UTARA MALAYSIA

Dear Sir / Madam,

I am a PhD candidate in the School of Technology, Management & Logistics (STML) at the College of Business Othman Yeop Abdullah (COB - OYA), Universiti Utara Malaysia. This questionnaire in part of my PhD study which aims to secure your opinion on the topic; Effects of Human Resource Capability, Production Planning System, Technology and Organizational Culture on Organizational Performance.

In completing this questionnaire, would you answer it honestly and in accordance with the actual situation. The answers will remain **confidential** and the results will be used solely for academic purposes.

Thank you for your cooperation and your time in completing this questionnaire.

Your Sincerely

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ORGANIZATION

A. PROFILE OF RESPONDENTS

Before answering the questions in the following sections, please fill in the following data. Please note that your answers will be treated as **CONFIDENTIAL**.

Enter a cross (X)

a. Job position : (1) Owner (2) CEO (3) Manager

b. Gender : (1) Male (2) Female

c. Age :

(1) ≤ 25 years (2) 26 – 35 years (3) 36 – 45 years

(4) 46 – 55 years (5) above 55 years

c. Educational level :
(1) Master (2) Bachelor degree (3) Diploma (4) High School (5) Others

d. Work Experience :
(1) Under 5 years (2) 5 – 10 years (3) 11 – 15 years

(4) 16 – 20 years (5) above 20 years

e. Status of employees in the workplace:
(1) Permanent (2) Contract

f. Number of employees :
(1) ≤ 5 (2) 6 – 10 (3) above 10

B. INSTRUCTIONS FOR COMPLETING THE QUESTIONNAIRE

1. Statements / questions are grouped in four MAJOR PARTS.
2. **RESPONDENTS** are expected to first read the description of each question before giving an answer.
3. **RESPONDENTS** can provide answers by giving entering a cross (X) in the appropriate box. Only one answer is possible to each question. 1 indicates that you strongly disagree with the statement; numbers progress to 7, strongly agree, as shown below.

Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

4. **RESPONDENTS'** personal data and all information provided will be guaranteed confidentiality, so please complete this questionnaire as truthfully and objectively as possible.

SECTION C.1 HUMAN RESOURCE CAPABILITY

Item No.	Questions / Statement Variables	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
		1	**2**	**3**	**4**	**5**	**6**	**7**

HUMAN RESOURCE CAPABILITY Please indicate how strongly you agree or disagree with the following statement in relation to the human resource capabilities that exist in your company.								
1.	My company always pays attention and places employees in accordance with their education level.	1	2	3	4	5	6	7
2.	At the operational level, my company has skilled human resources in their respective sectors to achieve company goals.	1	2	3	4	5	6	7
3.	At the managerial level, my company has skilled human resources in their respective sectors to achieve company goals.	1	2	3	4	5	6	7
4.	My company has human resources to carry out its duties effectively to achieve company goals.	1	2	3	4	5	6	7
5.	My company has the human resources to carry out the work and synergize tasks with other employees to achieve organizational goals.	1	2	3	4	5	6	7
6.	My company has human resources that can communicate well in their respective sectors.	1	2	3	4	5	6	7
7.	My company has human resources skilled in critical thinking and analysis.	1	2	3	4	5	6	7
8.	My company has human resources eager to learn continuously.	1	2	3	4	5	6	7
9.	My company has human resources to act as role models for other employees.	1	2	3	4	5	6	7
10.	My company has human resources capable of coordinating the major activities of the company.	1	2	3	4	5	6	7
11.	My company has human resources capable of coordinating staff to achieve organizational goals.	1	2	3	4	5	6	7
12.	My company has the human resources that can provide creative ideas in their duty to achieve and maintain the organization.	1	2	3	4	5	6	7
13.	My company has innovative human resources in carrying out duties for achieving and maintaining organizational	1	2	3	4	5	6	7

Item No.	Questions / Statement Variables	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
		1	2	3	4	5	6	7
	objectives.							
14.	My company responds well to the ideas submitted by employees to achieve and maintain the organization's objectives	1	2	3	4	5	6	7
15.	My company provides facilities to get creative ideas submitted by employees to achieve and maintain the organization's objectives.	1	2	3	4	5	6	7
16.	At the operational level, my company put in the field of human resources tasks according to their abilities.	1	2	3	4	5	6	7
17.	At the managerial level, my company allocates human resources tasks according to their abilities.	1	2	3	4	5	6	7
18.	My company provides facilities at managerial level in order to work well according to tasks and abilities.	1	2	3	4	5	6	7
19.	My company always pays attention to competence of the employees by involving the certification of expertise in accordance with their work.	1	2	3	4	5	6	7
20.	My company always involves the employees in the competencies that need to be improved to achieve higher qualifications.	1	2	3	4	5	6	7
21.	To enhance knowledge and skills, my company provides the opportunity for human resources training in the field of assignment.	1	2	3	4	5	6	7
22.	To enhance creativity and innovation, my company provides the opportunity for its human resources for training / apprenticeship as field duty.	1	2	3	4	5	6	7
23.	Human resources always have the opportunity for training / internship and submit a report in accordance with related duties.	1	2	3	4	5	6	7
24.	My company provides infrastructure and work environment in accordance with applicable regulations to achieve corporate goals.	1	2	3	4	5	6	7
25.	My company expects its human resources to comply with the rules governing their work	1	2	3	4	5	6	7

Item No.	Questions / Statement Variables	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
		1	**2**	**3**	**4**	**5**	**6**	**7**
	to achieve the company's goals.							
26.	My company has very loyal human resources to sustain and achieve organizational goals.	1	2	3	4	5	6	7
27.	My company has permanent human resources because of loyalty to the company.	1	2	3	4	5	6	7
28.	My company always provides compensation to employee performance.	1	2	3	4	5	6	7

SECTION C.2 PRODUCTION PLANNING SYSTEM IN YOUR COMPANY

Item No.	Questions / Statement Variables	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
		1	**2**	**3**	**4**	**5**	**6**	**7**

PRODUCTION PLANNING SYSTEM IN YOUR COMPANY Please indicate how strongly you agree or disagree with the following statement in relation to the production planning system in your company.								
29.	My organization has good production planning for the company's production capacity.	1	2	3	4	5	6	7
30.	My organization has proper planning and the right design for the company's goals.	1	2	3	4	5	6	7
31.	My organization has an effective utilization of resources.	1	2	3	4	5	6	7
32.	My organization has a production flow.	1	2	3	4	5	6	7
33.	My organization coordinates the activities of the departments.	1	2	3	4	5	6	7
34.	The production planning system in my organization improves labour productivity.	1	2	3	4	5	6	7
35.	The production planning system helps my company to capture the market.	1	2	3	4	5	6	7
36.	The production planning system in my organization generates customer satisfaction.	1	2	3	4	5	6	7
37.	The production planning system in my organization reduces production costs.	1	2	3	4	5	6	7
38.	Facilities planning in my organization are according to production requirements.	1	2	3	4	5	6	7
39.	My organization designs the plant layout according to production requirements.	1	2	3	4	5	6	7
40.	In my organization the layout of materials and equipment is according to production needs.	1	2	3	4	5	6	7
41.	Production space is in accordance with the requirements of work activity / production.	1	2	3	4	5	6	7
42.	My organization has a production plant that is broadly in line with the needs and requirements of the production facilities.	1	2	3	4	5	6	7
43.	My organization makes manufacturing facilities in accordance with the	1	2	3	4	5	6	7

Item No.	Questions / Statement Variables	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
		1	2	3	4	5	6	7
	requirements for production quality.							
44.	My organization chooses a good business location.	1	2	3	4	5	6	7
45.	My organization chooses the location of the plant in accordance with the requirements for the production of quality improvement.	1	2	3	4	5	6	7
46.	My organization chooses the location of the plant in accordance with the needs of production and attention to environmental factors.	1	2	3	4	5	6	7
47.	My organization easily obtains human resources, employees or workers.	1	2	3	4	5	6	7
48.	Work in my organization is effective and efficient in accordance with the planned production activities.	1	2	3	4	5	6	7
49.	Work in my organization is planned to carry out the activity of production / labour safely and comfortably.	1	2	3	4	5	6	7
50.	Storage facilities for materials and equipment have been designed to carry out the activity of production / labour safely and comfortably.	1	2	3	4	5	6	7
51.	Storage of materials / equipment has a good level of security to run production activities / work safely.	1	2	3	4	5	6	7
52.	In my organization the work has been well designed and has a clear operating procedure standard.	1	2	3	4	5	6	7
53.	In my organization every worker has documents to carry out the duties and functions.	1	2	3	4	5	6	7
54.	In my organization every worker has duties and functions that are clearly stated.	1	2	3	4	5	6	7
55.	In my organization every worker always pays attention to good environmental conditions.	1	2	3	4	5	6	7
56.	In my organization every task takes a standard time.	1	2	3	4	5	6	7
57.	In my organization every worker is employed continuously.	1	2	3	4	5	6	7

Item No.	Questions / Statement Variables	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
		1	**2**	**3**	**4**	**5**	**6**	**7**
58.	In my organization every worker uses methods appropriate to the type of work.	1	2	3	4	5	6	7
59.	In my organization every worker uses a machine that fits the job.	1	2	3	4	5	6	7
60.	In my organization every worker uses materials that fit the job.	1	2	3	4	5	6	7
61.	In my organization every worker uses equipment that fits the job.	1	2	3	4	5	6	7

SECTION C.3 TECHNOLOGY IN YOUR COMPANY

Item No.	Questions / Statement Variables	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
		1	**2**	**3**	**4**	**5**	**6**	**7**

TECHNOLOGY Please indicate how strongly you agree or disagree with the following statement in relation to the applied technology in your company.								
62.	Application of technology in my organization is supported by human resources with an appropriate level of technical ability to use the technology.	1	2	3	4	5	6	7
63.	Application of technology in my organization is supported by human resources with good social skills to use the technology.	1	2	3	4	5	6	7
64.	My organization has employees with appropriate technical skills to take care of equipment / machinery.	1	2	3	4	5	6	7
65.	My organization has employees with the technical skills and the right skills to repair the equipment / machinery.	1	2	3	4	5	6	7
66.	My organization has employees with the appropriate level of technical education for the job.	1	2	3	4	5	6	7
67.	My organization has employees with a good level of knowledge in the use of technology.	1	2	3	4	5	6	7
68.	My organization has employees with the level of technical knowledge and skills appropriate to repair the equipment / machinery.	1	2	3	4	5	6	7
69.	My organization has employees with the right skills to maintain the job environment.	1	2	3	4	5	6	7
70.	My organization has good equipment and machinery.	1	2	3	4	5	6	7
71.	My organizations always considers the effectiveness of the technology to support the production process.	1	2	3	4	5	6	7
72.	My organization always operates the machine in accordance with the technical specifications.	1	2	3	4	5	6	7
73.	My organization regularly schedules maintenance.	1	2	3	4	5	6	7

Item No.	Questions / Statement Variables	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
		1	**2**	**3**	**4**	**5**	**6**	**7**
74.	My organization has never lost the production process, even though the machine is down for maintenance.	1	2	3	4	5	6	7
75.	In production activities, my organization uses a machine for an optimum time.	1	2	3	4	5	6	7
76.	Within one month of production activities, my organization has never had to repeat work due to engine failure.	1	2	3	4	5	6	7
77.	Within one month of production activities, my organization often repeats work, due to operator error.	1	2	3	4	5	6	7

SECTION C.4 ORGANIZATIONAL CULTURE

Instruction :
Please indicate your answer by cross (X) the appropriate number about / based on organizational culture in your company/organization.

Item No.	Questions / Statement Variables	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
		1	2	3	4	5	6	7

ORGANIZATIONAL CULTURE How organizational culture at your place work?								
78.	In the culture developed in my organization, every human resource devotes all his ability to work.	1	2	3	4	5	6	7
79.	In the culture developed in my organization, every human resource organizes their own work.	1	2	3	4	5	6	7
80.	In the culture developed in my organization, every human has a good relationship with one another.	1	2	3	4	5	6	7
81.	In the culture developed in my organization, every human has the ability to take the initiative.	1	2	3	4	5	6	7
82.	Cultures that developed in my organization, each meeting are made on time.	1	2	3	4	5	6	7
83.	In the culture developed in my organization, everybody always pays attention to the costs incurred.	1	2	3	4	5	6	7
84.	In the culture developed in my organization, every human feels secure with their job.	1	2	3	4	5	6	7
85.	In the culture developed in my organization, every human resource is proud and appreciated.	1	2	3	4	5	6	7

SECTION C.5 ORGANIZATIONAL PERFORMANCE

Item No.	Questions / Statement Variables	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
		1	2	3	4	5	6	7

ORGANIZATIONAL PERFORMANCE

Please indicate the answer which best describes the average performance of your company over the past three years (your responses will be kept strictly confidential)

No.	Question /Statement Variable	Much Lower	Lower	Somewhat Lower	Neutral	Somewhat Higher	Higher	Much Higher
86.	Return on Sales (ROS)	1	2	3	4	5	6	7
87.	Return on Investment (ROI)	1	2	3	4	5	6	7
88.	Market share	1	2	3	4	5	6	7
89.	Sales growth rate	1	2	3	4	5	6	7

Please indicate how strongly you agree or disagree with the following statements in relation to your company's performance

		Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
90.	**Innovation and Learning Perspective:** The company is able to innovate, improve and learn, to increase new markets, revenues and margins in the bid to promote customers' interests.	1	2	3	4	5	6	7
91.	**Customer Perspective:** The company always considers the customers' concern over time, quality, performance, services and costs in order to pursue success.	1	2	3	4	5	6	7
92.	**Internal Business Perspective:** The company always considers the business processes that have the greatest impact on customer satisfaction, such as factors that affect cycle time, quality, employee skills and productivity.	1	2	3	4	5	6	7

Appendix B: Result of Validity Test Pilot Study (n=80)

B.1 Validity Test Human Resources Capabilities Items

Item	r_{count}	Sig.	Result
1	.462**	0.000	Valid
2	.419**	0.000	Valid
3	.584**	0.000	Valid
4	.472**	0.000	Valid
5	.404**	0.000	Valid
6	.354**	0.001	Valid
7	.369**	0.001	Valid
8	.449**	0.000	Valid
9	.430**	0.000	Valid
10	.444**	0.000	Valid
11	.559**	0.000	Valid
12	.445**	0.000	Valid
13	.426**	0.000	Valid
14	.407**	0.000	Valid
15	.373**	0.001	Valid
16	.359**	0.001	Valid
17	.444**	0.000	Valid
18	.382**	0.000	Valid
19	.258*	0.021	Valid
20	.415**	0.000	Valid
21	.452**	0.000	Valid
22	.438**	0.000	Valid
23	.492**	0.000	Valid
24	.345**	0.002	Valid
25	.271*	0.015	Valid
26	.352**	0.001	Valid
27	.385**	0.000	Valid
28	.435**	0.000	Valid

B. 2 Validity Test Planning Production System Items

Item	r_{count}	Sig.	Result
1	.626**	0.000	Valid
2	.673**	0.000	Valid
3	.684**	0.000	Valid
4	.626**	0.000	Valid
5	.569**	0.000	Valid
6	.628**	0.000	Valid
7	.662**	0.000	Valid
8	.548**	0.000	Valid
9	.405**	0.000	Valid
10	.460**	0.000	Valid
11	.627**	0.000	Valid
12	.433**	0.000	Valid
13	.626**	0.000	Valid
14	.553**	0.000	Valid
15	.588**	0.000	Valid
16	.586**	0.000	Valid
17	.498**	0.000	Valid
18	.320**	0.004	Valid
19	.290**	0.009	Valid
20	.442**	0.000	Valid
21	.637**	0.000	Valid
22	.722**	0.000	Valid
23	.644**	0.000	Valid
24	.428**	0.000	Valid
25	.493**	0.000	Valid
26	.620**	0.000	Valid
27	.716**	0.000	Valid
28	.677**	0.000	Valid
29	.681**	0.000	Valid
30	.336**	0.002	Valid
31	.508**	0.000	Valid
32	.353**	0.001	Valid
33	.455**	0.000	Valid

B.3 Validity Test Technology Items

Item	r_{count}	Sig.	Result
1	.489**	0.000	Valid
2	.709**	0.000	Valid
3	.602**	0.000	Valid
4	.733**	0.000	Valid
5	.719**	0.000	Valid
6	.722**	0.000	Valid
7	.767**	0.000	Valid
8	.714**	0.000	Valid
9	.567**	0.000	Valid
10	.751**	0.000	Valid
11	.616**	0.000	Valid
12	.780**	0.000	Valid
13	.705**	0.000	Valid
14	.393**	0.000	Valid
15	.373**	0.001	Valid
16	.369**	0.001	Valid

B. 4 Validity Test Organization Culture Items

Item	$r_{s.hitung}$	Sig.	Result
1	.741**	0.000	Valid
2	.853**	0.000	Valid
3	.771**	0.000	Valid
4	.639**	0.000	Valid
5	.693**	0.000	Valid
6	.638**	0.000	Valid
7	.738**	0.000	Valid
8	.532**	0.000	Valid

B. 5 Validity Test Organization Performance Items

Item	$r_{s.hitung}$	Sig.	Result
1	.732**	0.000	Valid
2	.632**	0.000	Valid
3	.732**	0.000	Valid
4	.863**	0.000	Valid
5	.768**	0.000	Valid
6	.778**	0.000	Valid
7	.832**	0.000	Valid

Appendix C: Comparison Validity and Reliability Pilot study and Main Study

C.1 Items of Human Resources Capability

Item	$r_{s.Pilot\ Data}$	$r_{s.\ Field\ Data}$	Gap $_{(Field – Pilot)}$
1	.462**	.492**	.030
2	.419**	.616**	.197
3	.584**	.632**	.048
4	.472**	.698**	.226
5	.404**	.585**	.181
6	.354**	.626**	.272
7	.369**	.547**	.178
8	.449**	.716**	.267
9	.430**	.636**	.206
10	.444**	.592**	.148
11	.559**	.579**	.020
12	.445**	.714**	.269
13	.426**	.512**	.086
14	.407**	.692**	.285
15	.373**	.671**	.298
16	.359**	.557**	.198
17	.444**	.735**	.291
18	.382**	.505**	.123
19	.258*	.537**	.279
20	.415**	.653**	.238
21	.452**	.701**	.249
22	.438**	.492**	.054
23	.492**	.616**	.124
24	.345**	.632**	.287
25	.271*	.698**	.427
26	.352**	.585**	.233
27	.385**	.626**	.241
28	.435**	.547**	.112

C.2 Items of Production Planning System

Item	$r_{s.Pilot Data}$	$r_{s. Field Data}$	Gap (Field – Pilot)
1	.626**	.520**	-.106
2	.673**	.575**	-.098
3	.684**	.604**	.080
4	.626**	.628**	.002
5	.569**	.451**	-.118
6	.628**	.692**	.064
7	.662**	.649**	-.013
8	.548**	.718**	.170
9	.405**	.396**	-.009
10	.460**	.580**	.120
11	.627**	.533**	-.094
12	.433**	.686**	.253
13	.626**	.642**	.016
14	.553**	.422**	-.131
15	.588**	.434**	-.154
16	.586**	.390**	-.196
17	.498**	.409**	-.089
18	.320**	.435**	.115
19	.290**	.669**	.379
20	.442**	.473**	.031
21	.637**	.522**	-.115
22	.722**	.450**	-.272
23	.644**	.685**	.041
24	.428**	.520**	.092
25	.493**	.466**	-.027
26	.620**	.557**	-.063
27	.716**	.494**	-.222
28	.677**	.531**	-.146
29	.681**	.426**	-.255
30	.336**	.538**	-.202
31	.508**	.487**	-.021
32	.353**	.660**	.307
33	.455**	.595**	.140

C.3 Items of Technology

Item	$r_{s.Pilot Data}$	$r_{s. Field Data}$	Gap (Field – Pilot)
1	.489**	.684**	.195
2	.709**	.796**	.087
3	.602**	.799**	.197
4	.733**	.759**	.026
5	.719**	.606**	-.113
6	.722**	.638**	-.084
7	.767**	.728**	-.039
8	.714**	.776**	.062
9	.567**	.680**	.113
10	.751**	.451**	-.300
11	.616**	.553**	-.063
12	.780**	.456**	-.324
13	.705**	.013	-.692
14	.393**	.454**	.061
15	.373**	.409**	.036
16	.369**	.548**	.179

C.4 Comparing Validity Test between Pilot Data versus Main Data

C.4.1 Items of Organization Culture

Item	$r_{s.Pilot Data}$	$r_{s. Field Data}$	Gap (Field – Pilot)
1	.741**	.623**	-.118
2	.853**	.743**	-.110
3	.771**	.716**	-.055
4	.639**	.708**	.069
5	.693**	.712**	.009
6	.638**	.747**	.109
7	.738**	.751**	.013
8	.532**	.724**	.192

C.4.2 Item Organization Performance

Item	$r_{s.Pilot Data}$	$r_{s.Field Data}$	Gap (Field – Pilot)
1	.732**	.797**	.065
2	.632**	.761**	.129
3	.732**	.779**	.047
4	.863**	.820**	-.043
5	.768**	.728**	-.040
6	.778**	.693**	-.085
7	.832**	.699**	-.133

C.4 Comparing Reliability Test between Pilot Data versus Field Data

No	Variabel	(r) Pilot Data	(r) Field Data	Gap
1	Human Resources Capabilities	0.957	0.932	-.025
2	Production Planning System	0.934	0.924	-.010
3	Technology	0.892	0.878	-.014
4	Organization Culture	0.858	0.877	.019
5	Organization Performance	0.897	0.876	-.021

C.5 Result Validity and Reliability Pilot Data versus Field Data

Correlations

			H1	H2	H3	H4	H5	H6	H7	HRC
Spearman's rho	H1	Correlation Coefficient	1.000	.430**	.349**	.241**	.284**	.340**	.412**	.492**
		Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H2	Correlation Coefficient	.430**	1.000	.397**	.409**	.387**	.458**	.387**	.616**
		Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H3	Correlation Coefficient	.349**	.397**	1.000	.435**	.424**	.415**	.312**	.632**
		Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H4	Correlation Coefficient	.241**	.409**	.435**	1.000	.461**	.445**	.335**	.698**
		Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H5	Correlation Coefficient	.284**	.387**	.424**	.461**	1.000	.438**	.288**	.585**
		Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H6	Correlation Coefficient	.340**	.458**	.415**	.445**	.438**	1.000	.552**	.626**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.	.000	.000
		N	360	360	360	360	360	360	360	360
	H7	Correlation Coefficient	.412**	.387**	.312**	.335**	.288**	.552**	1.000	.547**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.	.000
		N	360	360	360	360	360	360	360	360
	HRC	Correlation Coefficient	.492**	.616**	.632**	.698**	.585**	.626**	.547**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.
		N	360	360	360	360	360	360	360	360

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

Correlations

			H8	H9	H10	H11	H12	H13	H14	HRC
Spearman's rho	H8	Correlation Coefficient	1.000	.553**	.525**	.384**	.513**	.368**	.504**	.716**
		Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H9	Correlation Coefficient	.553**	1.000	.564**	.352**	.471**	.411**	.473**	.636**
		Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H10	Correlation Coefficient	.525**	.564**	1.000	.352**	.429**	.431**	.471**	.592**
		Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H11	Correlation Coefficient	.384**	.352**	.352**	1.000	.514**	.171**	.253**	.579**
		Sig. (2-tailed)	.000	.000	.000	.	.000	.001	.000	.000
		N	360	360	360	360	360	360	360	360
	H12	Correlation Coefficient	.513**	.471**	.429**	.514**	1.000	.462**	.418**	.714**
		Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H13	Correlation Coefficient	.368**	.411**	.431**	.171**	.462**	1.000	.437**	.512**
		Sig. (2-tailed)	.000	.000	.000	.001	.000	.	.000	.000
		N	360	360	360	360	360	360	360	360
	H14	Correlation Coefficient	.504**	.473**	.471**	.253**	.418**	.437**	1.000	.692**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.	.000
		N	360	360	360	360	360	360	360	360
	HRC	Correlation Coefficient	.716**	.636**	.592**	.579**	.714**	.512**	.692**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.
		N	360	360	360	360	360	360	360	360

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

Correlations

			H15	H16	H17	H18	H19	H20	H21	HRC
Spearman's rho	H15	Correlation Coefficient	1.000	.415**	.522**	.281**	.334**	.365**	.348**	.671**
		Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H16	Correlation Coefficient	.415**	1.000	.437**	.354**	.264**	.330**	.371**	.557**
		Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H17	Correlation Coefficient	.522**	.437**	1.000	.417**	.370**	.514**	.517**	.735**
		Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H18	Correlation Coefficient	.281**	.354**	.417**	1.000	.317**	.398**	.463**	.505**
		Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H19	Correlation Coefficient	.334**	.264**	.370**	.317**	1.000	.517**	.561**	.537**
		Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H20	Correlation Coefficient	.365**	.330**	.514**	.398**	.517**	1.000	.758**	.653**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.	.000	.000
		N	360	360	360	360	360	360	360	360
	H21	Correlation Coefficient	.348**	.371**	.517**	.463**	.561**	.758**	1.000	.701**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.	.000
		N	360	360	360	360	360	360	360	360
	HRC	Correlation Coefficient	.671**	.557**	.735**	.505**	.537**	.653**	.701**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.
		N	360	360	360	360	360	360	360	360

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

Correlations

			H22	H23	H24	H25	H26	H27	H28	HRC
Spearman's rho	H22	Correlation Coefficient	1.000	.515**	.325**	.267**	.266**	.367**	.088	.661**
		Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.097	.000
		N	360	360	360	360	360	360	360	360
	H23	Correlation Coefficient	.515**	1.000	.260**	.198**	.224**	.131*	.208**	.470**
		Sig. (2-tailed)	.000	.	.000	.000	.000	.013	.000	.000
		N	360	360	360	360	360	360	360	360
	H24	Correlation Coefficient	.325**	.260**	1.000	.574**	.439**	.413**	.279**	.586**
		Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H25	Correlation Coefficient	.267**	.198**	.574**	1.000	.401**	.356**	.217**	.491**
		Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H26	Correlation Coefficient	.266**	.224**	.439**	.401**	1.000	.488**	.318**	.489**
		Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	H27	Correlation Coefficient	.367**	.131*	.413**	.356**	.488**	1.000	.435**	.520**
		Sig. (2-tailed)	.000	.013	.000	.000	.000	.	.000	.000
		N	360	360	360	360	360	360	360	360
	H28	Correlation Coefficient	.088	.208**	.279**	.217**	.318**	.435**	1.000	.308**
		Sig. (2-tailed)	.097	.000	.000	.000	.000	.000	.	.000
		N	360	360	360	360	360	360	360	360
	HRC	Correlation Coefficient	.661**	.470**	.586**	.491**	.489**	.520**	.308**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.
		N	360	360	360	360	360	360	360	360

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

*. Correlation is significant at the 0.05 level (2-tailed).

Correlations

			P1	P2	P3	P4	P5	P6	P7	P8	PPS
Spearman's rho	P1	Correlation Coefficient	1.000	.334**	.287**	.247**	.345**	.351**	.421**	.397**	.520**
		Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P2	Correlation Coefficient	.334**	1.000	.512**	.426**	.215**	.482**	.487**	.469**	.575**
		Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P3	Correlation Coefficient	.287**	.512**	1.000	.421**	.344**	.461**	.348**	.390**	.604**
		Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P4	Correlation Coefficient	.247**	.426**	.421**	1.000	.154**	.466**	.409**	.456**	.628**
		Sig. (2-tailed)	.000	.000	.000	.	.003	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P5	Correlation Coefficient	.345**	.215**	.344**	.154**	1.000	.286**	.333**	.393**	.451**
		Sig. (2-tailed)	.000	.000	.000	.003	.	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P6	Correlation Coefficient	.351**	.482**	.461**	.466**	.286**	1.000	.495**	.563**	.692**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P7	Correlation Coefficient	.421**	.487**	.348**	.409**	.333**	.495**	1.000	.537**	.649**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P8	Correlation Coefficient	.397**	.469**	.390**	.456**	.393**	.563**	.537**	1.000	.718**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.	.000
		N	360	360	360	360	360	360	360	360	360
	PPS	Correlation Coefficient	.520**	.575**	.604**	.628**	.451**	.692**	.649**	.718**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.
		N	360	360	360	360	360	360	360	360	360

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

Correlations

			P9	P10	P11	P12	P13	P14	P15	P16	PPS
Spearman's rho	P9	Correlation Coefficient	1.000	.179**	.257**	.166**	.208**	-.048	.342**	.295**	.396**
		Sig. (2-tailed)	.	.001	.000	.002	.000	.360	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P10	Correlation Coefficient	.179**	1.000	.398**	.511**	.436**	.165**	.216**	.163**	.580**
		Sig. (2-tailed)	.001	.	.000	.000	.000	.002	.000	.002	.000
		N	360	360	360	360	360	360	360	360	360
	P11	Correlation Coefficient	.257**	.398**	1.000	.472**	.323**	.141**	.197**	.237**	.533**
		Sig. (2-tailed)	.000	.000	.	.000	.000	.007	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P12	Correlation Coefficient	.166**	.511**	.472**	1.000	.488**	.217**	.187**	.266**	.686**
		Sig. (2-tailed)	.002	.000	.000	.	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P13	Correlation Coefficient	.208**	.436**	.323**	.488**	1.000	.311**	.216**	.226**	.642**
		Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P14	Correlation Coefficient	-.048	.165**	.141**	.217**	.311**	1.000	.324**	.216**	.422**
		Sig. (2-tailed)	.360	.002	.007	.000	.000	.	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P15	Correlation Coefficient	.342**	.216**	.197**	.187**	.216**	.324**	1.000	.404**	.434**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P16	Correlation Coefficient	.295**	.163**	.237**	.266**	.226**	.216**	.404**	1.000	.390**
		Sig. (2-tailed)	.000	.002	.000	.000	.000	.000	.000	.	.000
		N	360	360	360	360	360	360	360	360	360
	PPS	Correlation Coefficient	.396**	.580**	.533**	.686**	.642**	.422**	.434**	.390**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.
		N	360	360	360	360	360	360	360	360	360

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

Correlations

			P17	P18	P19	P20	P21	P22	P23	P24	PPS
Spearman's rho	P17	Correlation Coefficient	1.000	.532**	.246**	.257**	.237**	.101	.200**	.274**	.409**
		Sig. (2-tailed)	.	.000	.000	.000	.000	.055	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P18	Correlation Coefficient	.532**	1.000	.317**	.357**	.226**	.110*	.194**	.254**	.435**
		Sig. (2-tailed)	.000	.	.000	.000	.000	.037	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P19	Correlation Coefficient	.246**	.317**	1.000	.349**	.394**	.208**	.411**	.257**	.669**
		Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P20	Correlation Coefficient	.257**	.357**	.349**	1.000	.332**	.169**	.219**	.229**	.473**
		Sig. (2-tailed)	.000	.000	.000	.	.000	.001	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P21	Correlation Coefficient	.237**	.226**	.394**	.332**	1.000	.343**	.351**	.285**	.522**
		Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P22	Correlation Coefficient	.101	.110*	.208**	.169**	.343**	1.000	.440**	.276**	.450**
		Sig. (2-tailed)	.055	.037	.000	.001	.000	.	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P23	Correlation Coefficient	.200**	.194**	.411**	.219**	.351**	.440**	1.000	.487**	.685**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.	.000	.000
		N	360	360	360	360	360	360	360	360	360
	P24	Correlation Coefficient	.274**	.254**	.257**	.229**	.285**	.276**	.487**	1.000	.520**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.	.000
		N	360	360	360	360	360	360	360	360	360
	PPS	Correlation Coefficient	.409**	.435**	.669**	.473**	.522**	.450**	.685**	.520**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.
		N	360	360	360	360	360	360	360	360	360

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

*. Correlation is significant at the 0.05 level (2-tailed).

Correlations

			P25	P26	P27	P28	P29	P30	P31	P32	P33	PPS
Spearman's rho	P25	Correlation Coefficient	1.000	.275**	.143**	.230**	.251**	.246**	.349**	.398**	.346**	.466**
		Sig. (2-tailed)	.	.000	.007	.000	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360	360
	P26	Correlation Coefficient	.275**	1.000	.421**	.377**	.234**	.258**	.297**	.390**	.380**	.557**
		Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360	360
	P27	Correlation Coefficient	.143**	.421**	1.000	.409**	.132*	.229**	.121*	.292**	.215**	.494**
		Sig. (2-tailed)	.007	.000	.	.000	.012	.000	.021	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360	360
	P28	Correlation Coefficient	.230**	.377**	.409**	1.000	.368**	.265**	.195**	.309**	.260**	.531**
		Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360	360
	P29	Correlation Coefficient	.251**	.234**	.132*	.368**	1.000	.238**	.377**	.316**	.183**	.426**
		Sig. (2-tailed)	.000	.000	.012	.000	.	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360	360
	P30	Correlation Coefficient	.246**	.258**	.229**	.265**	.238**	1.000	.441**	.481**	.473**	.538**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360	360
	P31	Correlation Coefficient	.349**	.297**	.121*	.195**	.377**	.441**	1.000	.528**	.557**	.487**
		Sig. (2-tailed)	.000	.000	.021	.000	.000	.000	.	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360	360
	P32	Correlation Coefficient	.398**	.390**	.292**	.309**	.316**	.481**	.528**	1.000	.716**	.660**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.	.000	.000
		N	360	360	360	360	360	360	360	360	360	360
	P33	Correlation Coefficient	.346**	.380**	.215**	.260**	.183**	.473**	.557**	.716**	1.000	.595**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.	.000
		N	360	360	360	360	360	360	360	360	360	360
	PPS	Correlation Coefficient	.466**	.557**	.494**	.531**	.426**	.538**	.487**	.660**	.595**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.
		N	360	360	360	360	360	360	360	360	360	360

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Correlations

			T1	T2	T3	T4	T5	T6	T7	T8	TECH
Spearman's rho	T1	Correlation Coefficient	1.000	.636**	.618**	.540**	.325**	.355**	.475**	.534**	.684**
		Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	T2	Correlation Coefficient	.636**	1.000	.700**	.685**	.467**	.448**	.488**	.610**	.796**
		Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	T3	Correlation Coefficient	.618**	.700**	1.000	.677**	.527**	.478**	.526**	.602**	.799**
		Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	T4	Correlation Coefficient	.540**	.685**	.677**	1.000	.469**	.440**	.503**	.650**	.759**
		Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	T5	Correlation Coefficient	.325**	.467**	.527**	.469**	1.000	.578**	.443**	.425**	.606**
		Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	T6	Correlation Coefficient	.355**	.448**	.478**	.440**	.578**	1.000	.586**	.494**	.638**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	T7	Correlation Coefficient	.475**	.488**	.526**	.503**	.443**	.586**	1.000	.606**	.728**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.	.000	.000
		N	360	360	360	360	360	360	360	360	360
	T8	Correlation Coefficient	.534**	.610**	.602**	.650**	.425**	.494**	.606**	1.000	.776**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.	.000
		N	360	360	360	360	360	360	360	360	360
	TECH	Correlation Coefficient	.684**	.796**	.799**	.759**	.606**	.638**	.728**	.776**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.
		N	360	360	360	360	360	360	360	360	360

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

Correlations

			T9	T10	T11	T12	T13	T14	T15	T16	TECH
Spearman's rho	T9	Correlation Coefficient	1.000	.420**	.218**	.218**	-.062	.330**	.171**	.341**	.680**
		Sig. (2-tailed)	.	.000	.000	.000	.242	.000	.001	.000	.000
		N	360	360	360	360	360	360	360	360	360
	T10	Correlation Coefficient	.420**	1.000	.283**	.159**	.028	.090	.206**	.321**	.451**
		Sig. (2-tailed)	.000	.	.000	.002	.591	.089	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	T11	Correlation Coefficient	.218**	.283**	1.000	.253**	.026	.160**	.376**	.332**	.553**
		Sig. (2-tailed)	.000	.000	.	.000	.625	.002	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	T12	Correlation Coefficient	.218**	.159**	.253**	1.000	-.279**	.401**	.142**	.237**	.456**
		Sig. (2-tailed)	.000	.002	.000	.	.000	.000	.007	.000	.000
		N	360	360	360	360	360	360	360	360	360
	T13	Correlation Coefficient	-.062	.028	.026	-.279**	1.000	-.317**	.073	-.060	.013
		Sig. (2-tailed)	.242	.591	.625	.000	.	.000	.169	.256	.810
		N	360	360	360	360	360	360	360	360	360
	T14	Correlation Coefficient	.330**	.090	.160**	.401**	-.317**	1.000	.193**	.301**	.454**
		Sig. (2-tailed)	.000	.089	.002	.000	.000	.	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	T15	Correlation Coefficient	.171**	.206**	.376**	.142**	.073	.193**	1.000	.323**	.409**
		Sig. (2-tailed)	.001	.000	.000	.007	.169	.000	.	.000	.000
		N	360	360	360	360	360	360	360	360	360
	T16	Correlation Coefficient	.341**	.321**	.332**	.237**	-.060	.301**	.323**	1.000	.548**
		Sig. (2-tailed)	.000	.000	.000	.000	.256	.000	.000	.	.000
		N	360	360	360	360	360	360	360	360	360
	TECH	Correlation Coefficient	.680**	.451**	.553**	.456**	.013	.454**	.409**	.548**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.810	.000	.000	.000	.
		N	360	360	360	360	360	360	360	360	360

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

Correlations

			OC1	OC2	OC3	OC4	OC5	OC6	OC7	OC8	OC
Spearman's rho	OC1	Correlation Coefficient	1.000	.439**	.417**	.374**	.326**	.381**	.422**	.380**	.623**
		Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	OC2	Correlation Coefficient	.439**	1.000	.569**	.440**	.437**	.453**	.472**	.490**	.743**
		Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	OC3	Correlation Coefficient	.417**	.569**	1.000	.485**	.401**	.417**	.441**	.428**	.716**
		Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	OC4	Correlation Coefficient	.374**	.440**	.485**	1.000	.575**	.496**	.452**	.365**	.708**
		Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	OC5	Correlation Coefficient	.326**	.437**	.401**	.575**	1.000	.504**	.455**	.413**	.712**
		Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	OC6	Correlation Coefficient	.381**	.453**	.417**	.496**	.504**	1.000	.582**	.594**	.747**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.	.000	.000	.000
		N	360	360	360	360	360	360	360	360	360
	OC7	Correlation Coefficient	.422**	.472**	.441**	.452**	.455**	.582**	1.000	.584**	.751**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.	.000	.000
		N	360	360	360	360	360	360	360	360	360
	OC8	Correlation Coefficient	.380**	.490**	.428**	.365**	.413**	.594**	.584**	1.000	.724**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.	.000
		N	360	360	360	360	360	360	360	360	360
	OC	Correlation Coefficient	.623**	.743**	.716**	.708**	.712**	.747**	.751**	.724**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.
		N	360	360	360	360	360	360	360	360	360

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

Correlations

			OP1	OP2	OP3	OP4	OP5	OP6	OP7	OP
Spearman's rho	OP1	Correlation Coefficient	1.000	.641**	.545**	.604**	.533**	.490**	.427**	.797**
		Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	OP2	Correlation Coefficient	.641**	1.000	.597**	.617**	.468**	.401**	.407**	.761**
		Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	OP3	Correlation Coefficient	.545**	.597**	1.000	.700**	.467**	.477**	.434**	.779**
		Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	OP4	Correlation Coefficient	.604**	.617**	.700**	1.000	.537**	.437**	.529**	.820**
		Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	OP5	Correlation Coefficient	.533**	.468**	.467**	.537**	1.000	.461**	.430**	.728**
		Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000	.000
		N	360	360	360	360	360	360	360	360
	OP6	Correlation Coefficient	.490**	.401**	.477**	.437**	.461**	1.000	.471**	.693**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.	.000	.000
		N	360	360	360	360	360	360	360	360
	OP7	Correlation Coefficient	.427**	.407**	.434**	.529**	.430**	.471**	1.000	.699**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.	.000
		N	360	360	360	360	360	360	360	360
	OP	Correlation Coefficient	.797**	.761**	.779**	.820**	.728**	.693**	.699**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.
		N	360	360	360	360	360	360	360	360

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

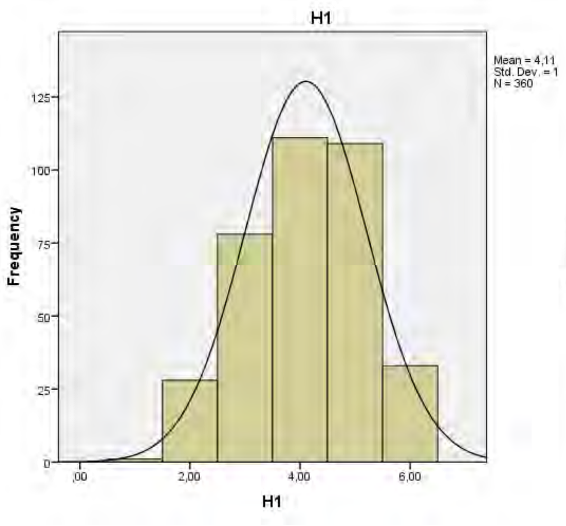
Appendix D: Statistic Data and Histogram Curve's

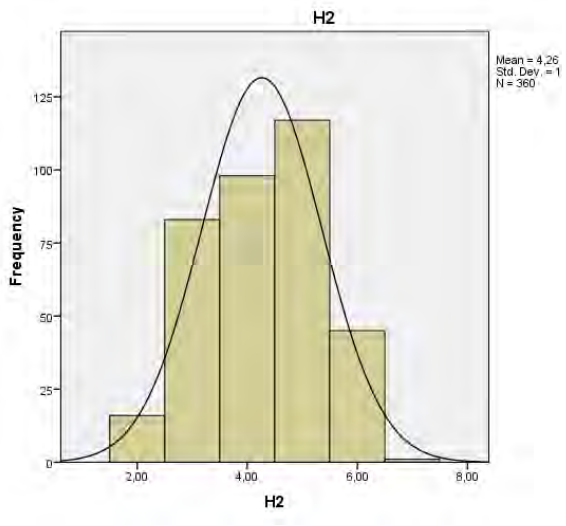
D. 1 Statistics Data

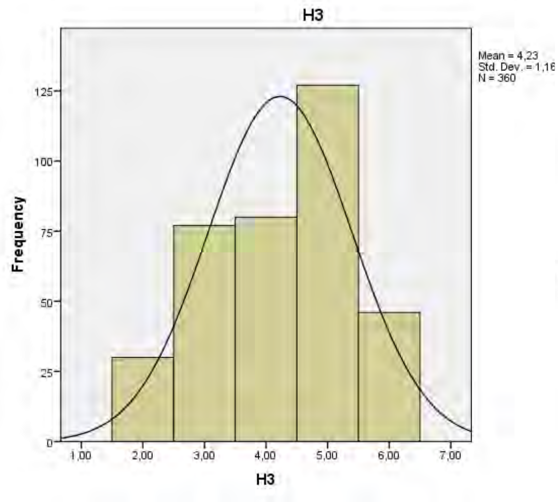
	N		Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
	Valid	Missing				
H1	360	0	-.198	.129	-.616	.256
H2	360	0	-.113	.129	-.769	.256
H3	360	0	-.283	.129	-.871	.256
H4	360	0	.027	.129	-.794	.256
H5	360	0	-.243	.129	-.795	.256
H6	360	0	-.421	.129	-.486	.256
H7	360	0	-.274	.129	-.192	.256
H8	360	0	-.075	.129	-.445	.256
H9	360	0	-.051	.129	-.337	.256
H10	360	0	.106	.129	-.265	.256
H11	360	0	.033	.129	-.553	.256
H12	360	0	-.021	.129	-.345	.256
H13	360	0	.121	.129	-.628	.256
H14	360	0	.119	.129	-.413	.256
H15	360	0	.074	.129	-.558	.256
H16	360	0	-.090	.129	-.741	.256
H17	360	0	.078	.129	-.516	.256
H18	360	0	-.043	.129	-.651	.256
H19	360	0	-.205	.129	-.690	.256
H20	360	0	-.189	.129	-.694	.256
H21	360	0	-.200	.129	-.819	.256
H22	360	0	.277	.129	-.395	.256
H23	360	0	-.145	.129	-.069	.256
H24	360	0	.254	.129	-.077	.256
H25	360	0	.181	.129	-.031	.256
H26	360	0	-.090	.129	-.174	.256
H27	360	0	.154	.129	-.214	.256
H28	360	0	.497	.129	-.143	.256
P1	360	0	-.297	.129	-.719	.256
P2	360	0	-.310	.129	-.480	.256
P3	360	0	-.182	.129	-.319	.256
P4	360	0	.288	.129	-.474	.256
P5	360	0	-.032	.129	-.668	.256
P6	360	0	-.217	.129	-.545	.256
P7	360	0	.109	.129	-.504	.256
P8	360	0	.034	.129	-.578	.256
P9	360	0	-.206	.129	-.486	.256
P10	360	0	-.285	.129	-.193	.256
P11	360	0	-.383	.129	-.442	.256
P12	360	0	.068	.129	-.564	.256
P13	360	0	-.259	.129	-.461	.256
P14	360	0	-.143	.129	-.216	.256
P15	360	0	.027	.129	-.365	.256
P16	360	0	-.168	.129	-.302	.256
P17	360	0	.257	.129	-.278	.256
P18	360	0	.014	.129	-.561	.256
P19	360	0	-.033	.129	-.410	.256
P20	360	0	-.228	.129	-.585	.256
P21	360	0	-.196	.129	-.352	.256
P22	360	0	-.421	.129	-.714	.256
P23	360	0	.191	.129	-.726	.256
P23	360	0	-.169	.129	-.691	.256
P25	360	0	.281	.129	-.546	.256
P26	360	0	-.090	.129	-.724	.256
P27	360	0	-.195	.129	-.769	.256
P28	360	0	.203	.129	-.443	.256
P29	360	0	.232	.129	-.715	.256
P30	360	0	-.190	.129	-.340	.256

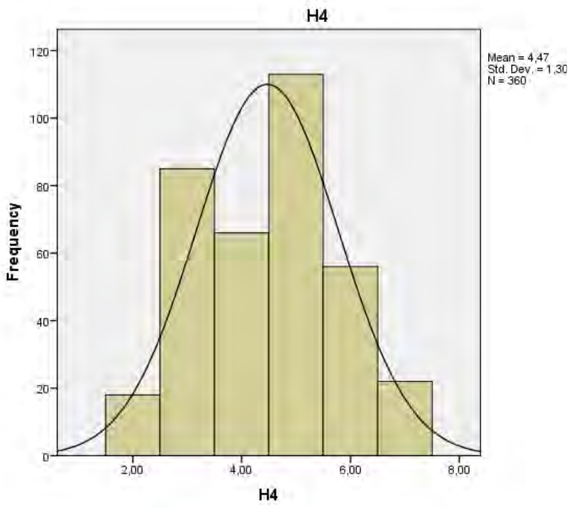
P31	360	0	.032	.129	-.383	.256
P32	360	0	-.178	.129	-.278	.256
P33	360	0	-.232	.129	-.166	.256
T1	360	0	-.516	.129	-.232	.256
T2	360	0	-.456	.129	-.377	.256
T3	360	0	-.020	.129	-.729	.256
T4	360	0	-.158	.129	-.335	.256
T5	360	0	.305	.129	.060	.256
T6	360	0	-.265	.129	-.252	.256
T7	360	0	-.547	.129	-.173	.256
T8	360	0	-.684	.129	-.093	.256
T9	360	0	-.076	.129	-.264	.256
T10	360	0	-.117	.129	-.386	.256
T11	360	0	.089	.129	-.230	.256
T12	360	0	-.140	.129	-.425	.256
T13	360	0	-.316	.129	-.797	.256
T14	360	0	-.177	.129	-.426	.256
T15	360	0	-.184	.129	-.884	.256
T16	360	0	-.294	.129	-.603	.256
OC1	360	0	-.244	.129	-.233	.256
OC2	360	0	-.200	.129	-.558	.256
OC3	360	0	-.036	.129	-.760	.256
OC4	360	0	-.076	.129	-.720	.256
OC5	360	0	-.024	.129	-.782	.256
OC6	360	0	-.223	.129	-.600	.256
OC7	360	0	-.157	.129	-.783	.256
OC8	360	0	-.229	.129	-.194	.256
OP1	360	0	-.189	.129	-1.084	.256
OP2	360	0	-.109	.129	-.693	.256
OP3	360	0	-.039	.129	-.732	.256
OP4	360	0	.110	.129	-.943	.256
OP5	360	0	.091	.129	-.851	.256
OP6	360	0	-.157	.129	-.566	.256
OP7	360	0	-.233	.129	-.802	.256

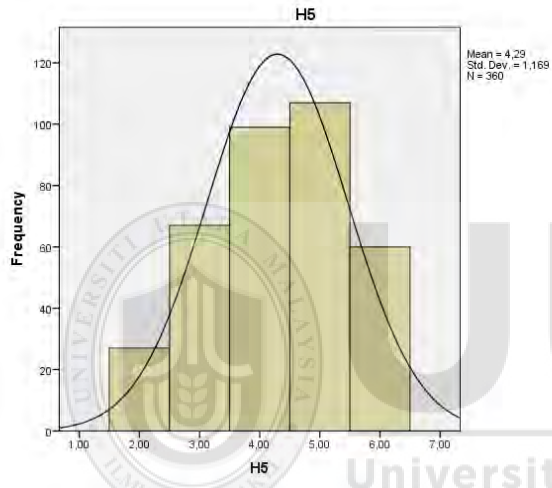
D.2 Histogram Curve's

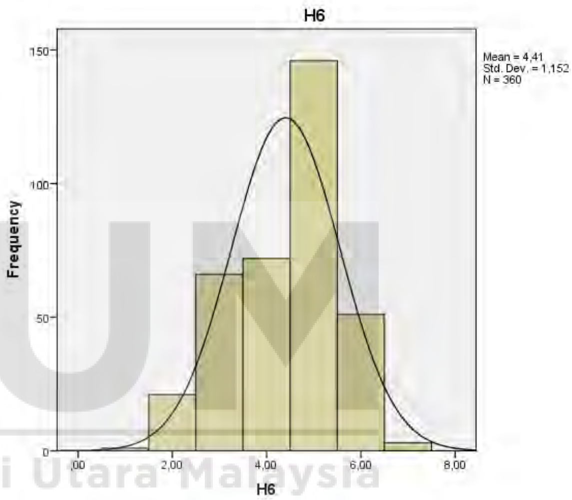


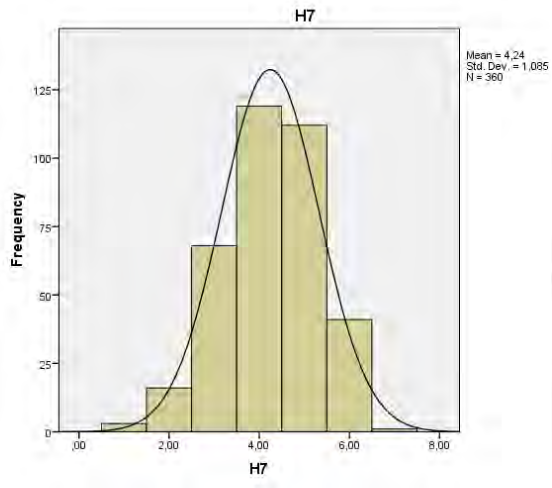


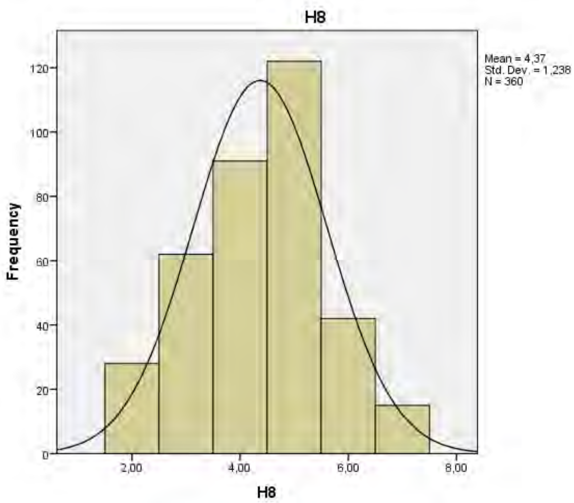

H3
Mean = 4,23
Std. Dev. = 1,16
N = 360
Frequency
H3

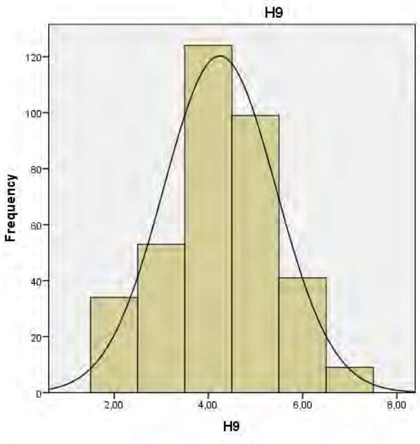

H4
Mean = 4,47
Std. Dev. = 1,30
N = 360
Frequency
H4

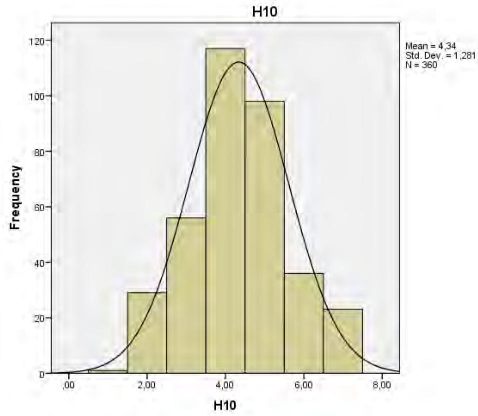

H5
Mean = 4,29
Std. Dev. = 1,169
N = 360
Frequency
H5

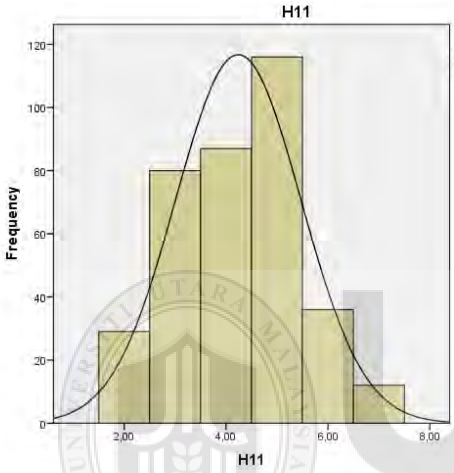

H6
Mean = 4,41
Std. Dev. = 1,152
N = 360
Frequency
H6

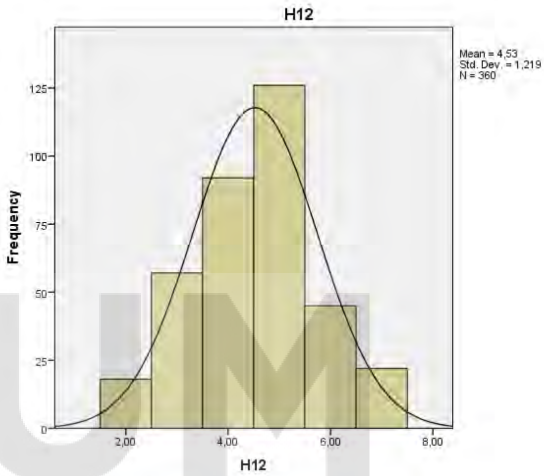

H7
Mean = 4,24
Std. Dev. = 1,085
N = 360
Frequency
H7

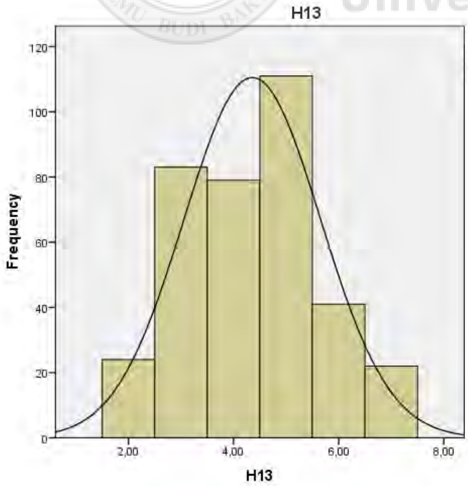

H8
Mean = 4,37
Std. Dev. = 1,238
N = 360
Frequency
H8

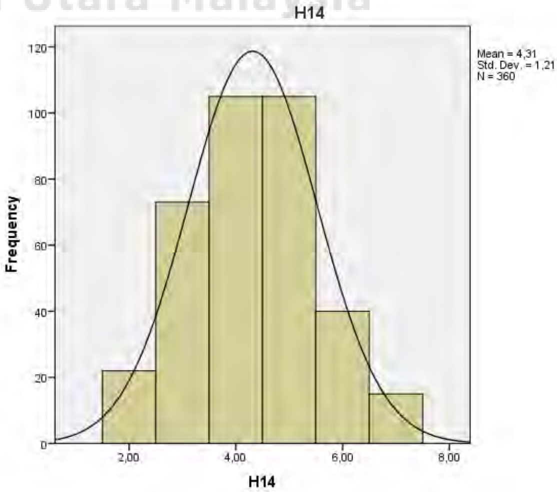

H9
Mean = 4,24
Std. Dev. = 1,194
N = 360
Frequency
H9

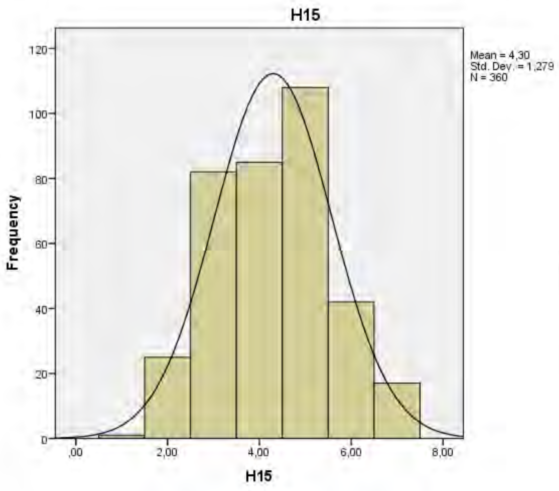
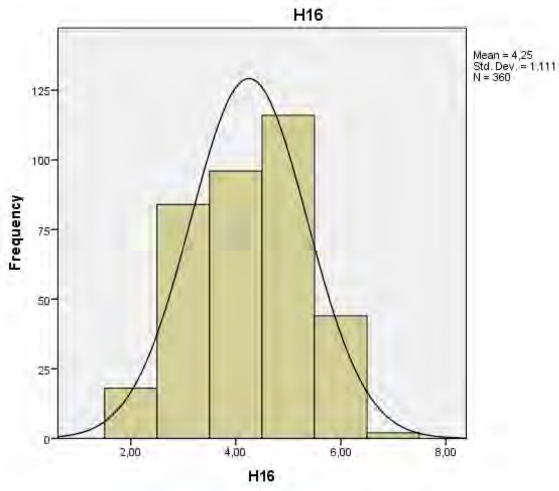
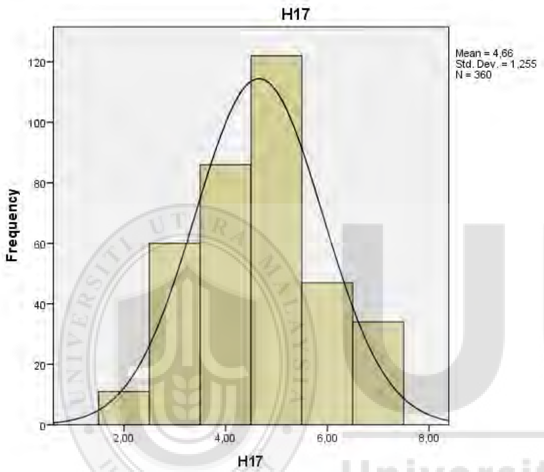
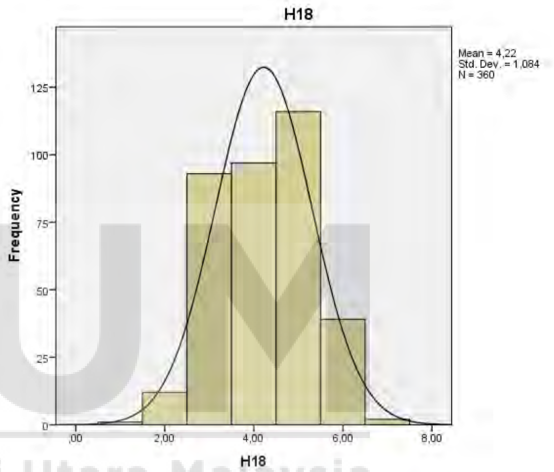

H10
Mean = 4,34
Std. Dev. = 1,281
N = 360
Frequency
H10

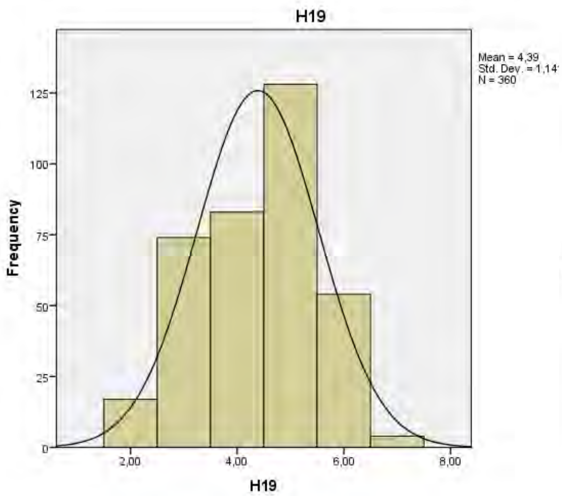
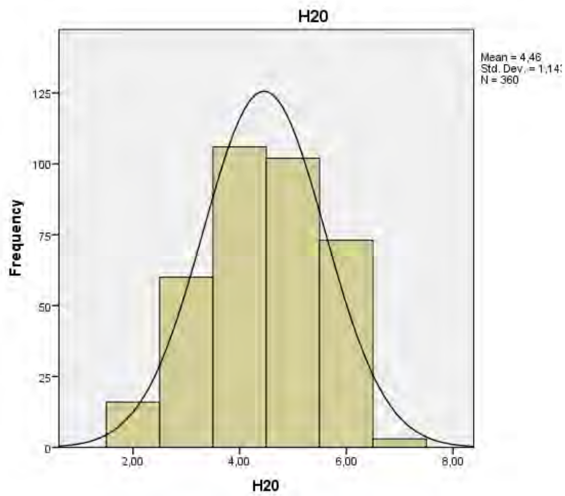

H11
Mean = 4,24
Std. Dev. = 1,23
N = 360
Frequency
H11

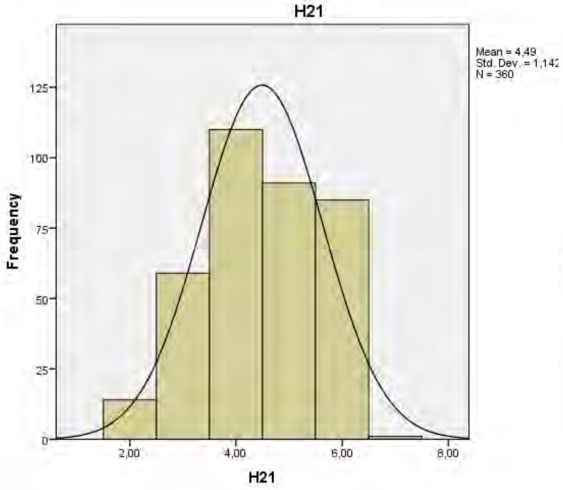

H12
Mean = 4,53
Std. Dev. = 1,219
N = 360
Frequency
H12

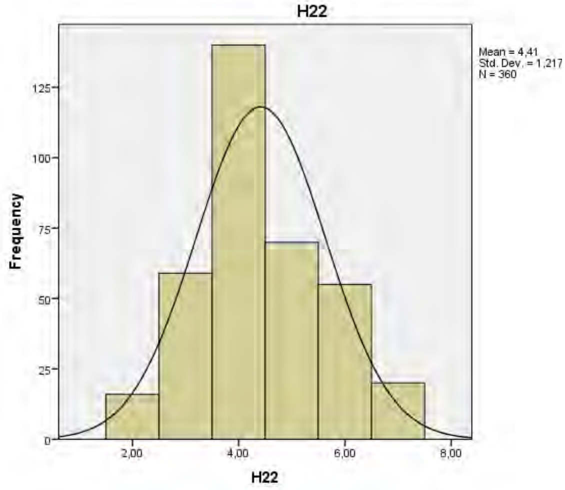

H13
Mean = 4,36
Std. Dev. = 1,30
N = 360
Frequency
H13

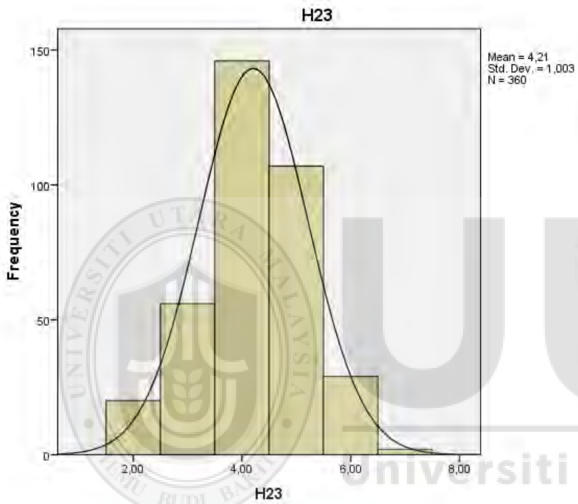

H14
Mean = 4,31
Std. Dev. = 1,21
N = 360
Frequency
H14

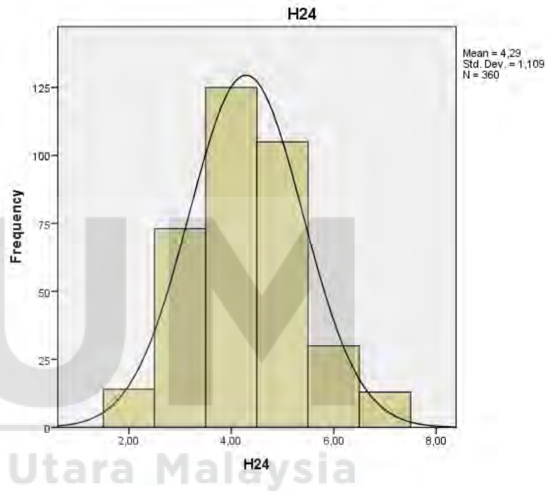

H15
Mean = 4,30
Std. Dev. = 1,279
N = 360
Frequency
H15

H16
Mean = 4,25
Std. Dev. = 1,111
N = 360
Frequency
H16

H17
Mean = 4,66
Std. Dev. = 1,255
N = 360
Frequency
H17

H18
Mean = 4,22
Std. Dev. = 1,084
N = 360
Frequency
H18

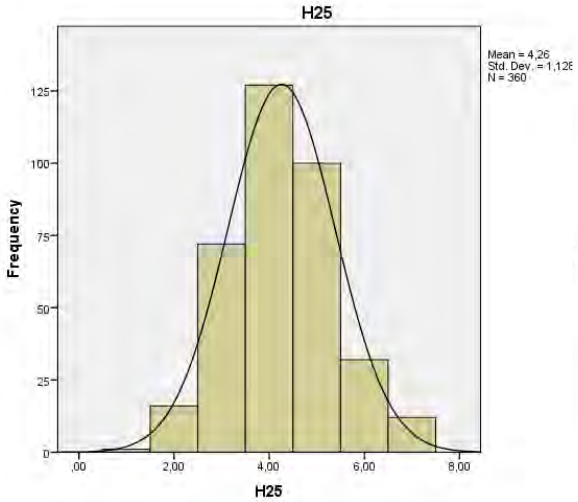

H19
Mean = 4,39
Std. Dev. = 1,14
N = 360
Frequency
H19

H20
Mean = 4,46
Std. Dev. = 1,14
N = 360
Frequency
H20

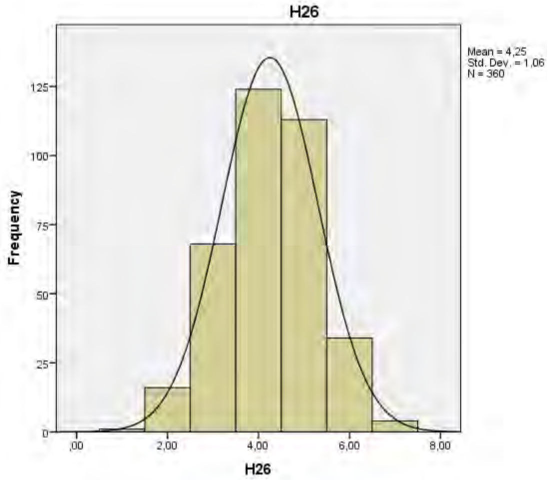

H21
Mean = 4,49
Std. Dev. = 1,142
N = 360
Frequency
0
25
50
75
100
125
2,00
4,00
6,00
8,00
H21

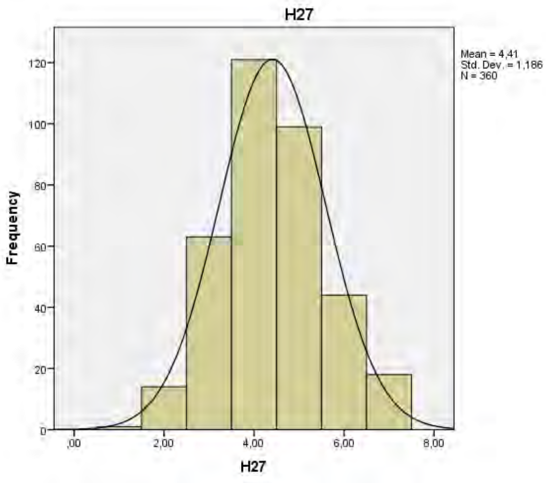

H22
Mean = 4,41
Std. Dev. = 1,217
N = 360
Frequency
0
25
50
75
100
125
2,00
4,00
6,00
8,00
H22

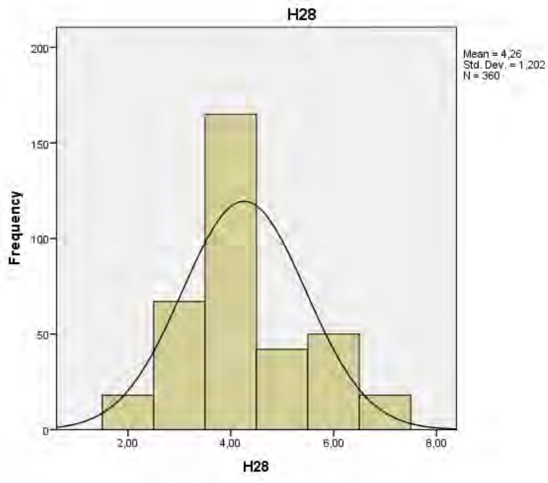

H23
Mean = 4,21
Std. Dev. = 1,003
N = 360
Frequency
0
50
100
150
2,00
4,00
6,00
8,00
H23

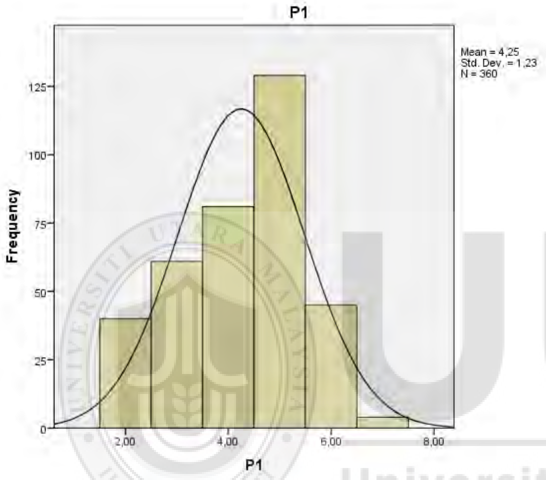

H24
Mean = 4,29
Std. Dev. = 1,109
N = 360
Frequency
0
25
50
75
100
125
2,00
4,00
6,00
8,00
H24

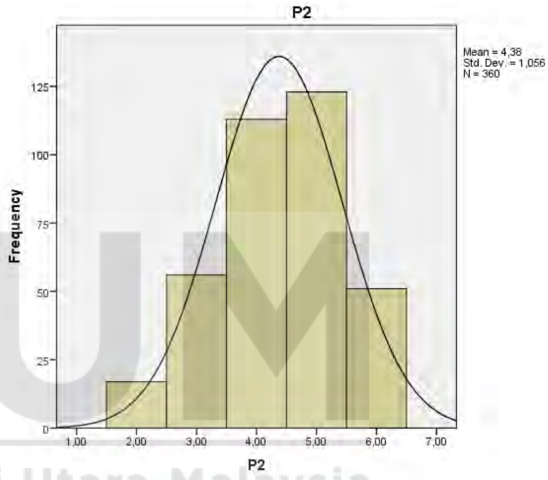

H25
Mean = 4,26
Std. Dev. = 1,128
N = 360
Frequency
0
25
50
75
100
125
,00
2,00
4,00
6,00
8,00
H25

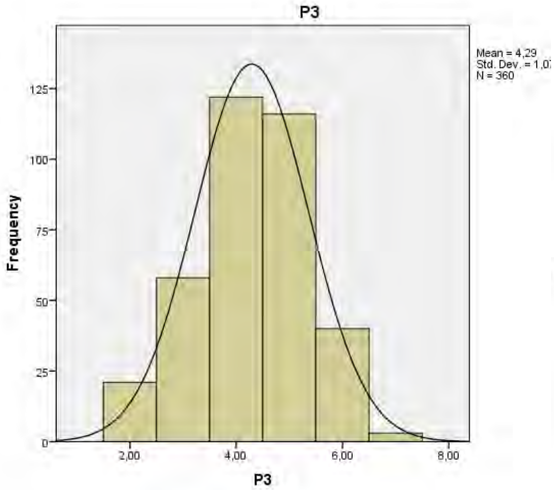

H26
Mean = 4,25
Std. Dev. = 1,06
N = 360
Frequency
0
25
50
75
100
125
,00
2,00
4,00
6,00
8,00
H26

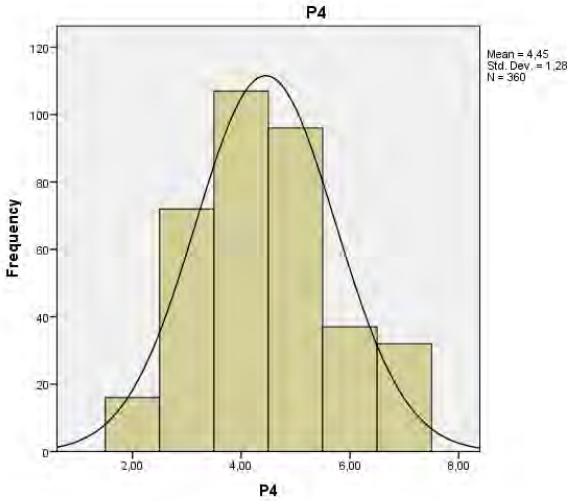

H27
Mean = 4,41
Std. Dev. = 1,186
N = 360
Frequency
H27

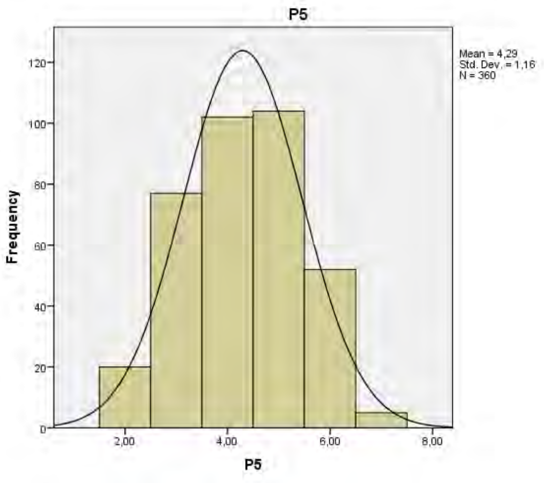

H28
Mean = 4,26
Std. Dev. = 1,202
N = 360
Frequency
H28

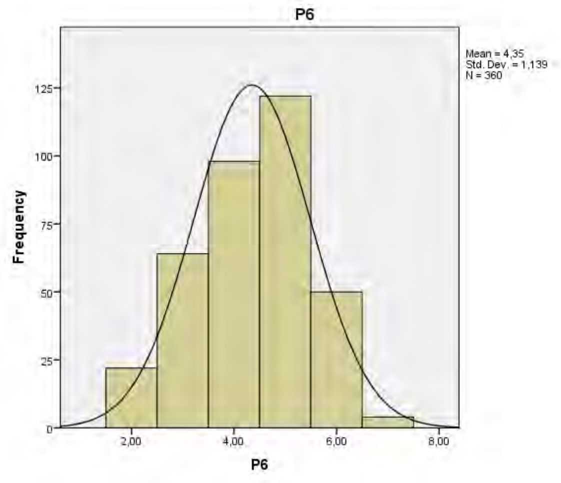

P1
Mean = 4,25
Std. Dev. = 1,23
N = 360
Frequency
P1

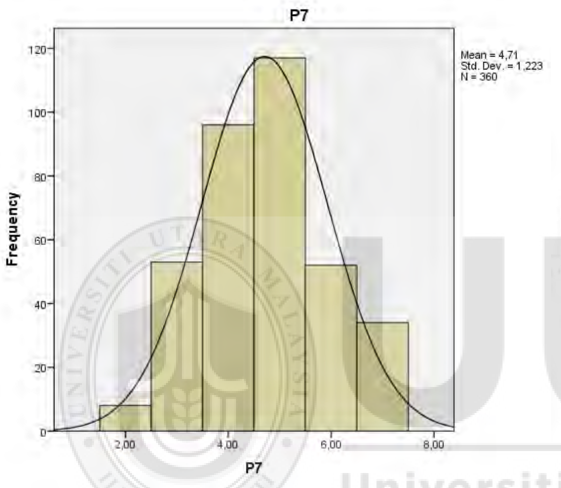

P2
Mean = 4,38
Std. Dev. = 1,056
N = 360
Frequency
P2

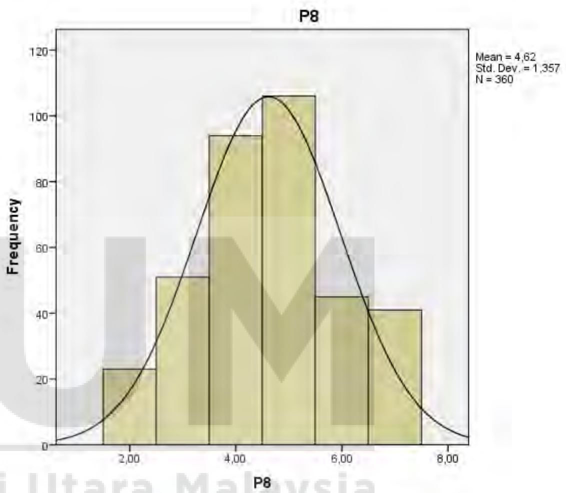

P3
Mean = 4,29
N = 360
Frequency
P3

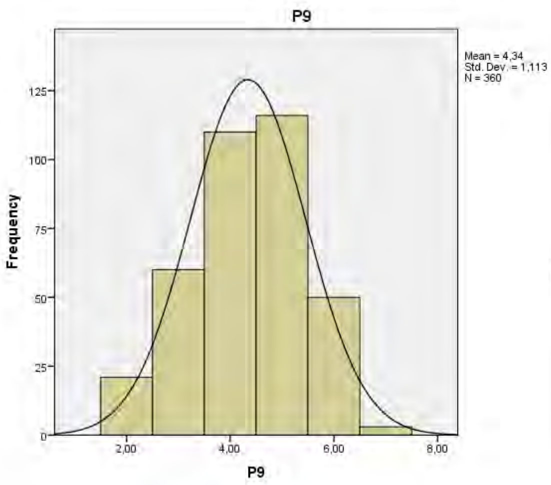

P4
Mean = 4,45
Std. Dev. = 1,28
N = 360
Frequency
P4

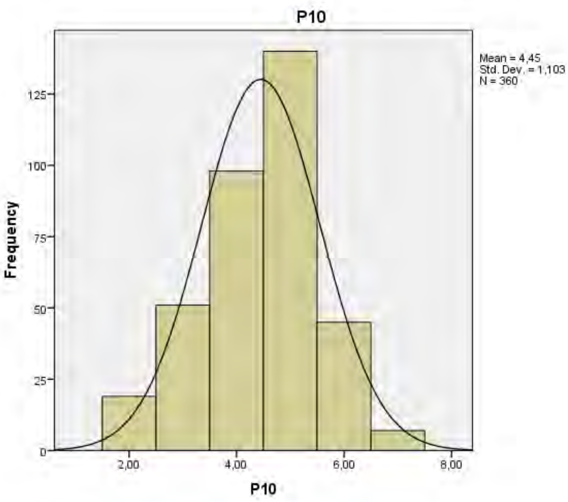

P5
Mean = 4,29
Std. Dev. = 1,16
N = 360
Frequency
P5

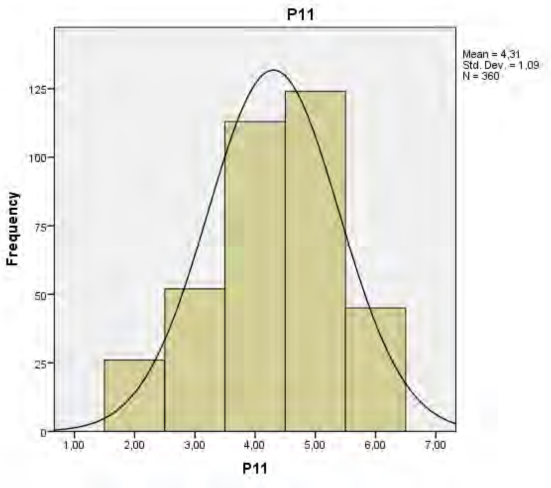

P6
Mean = 4,35
Std. Dev. = 1,139
N = 360
Frequency
P6

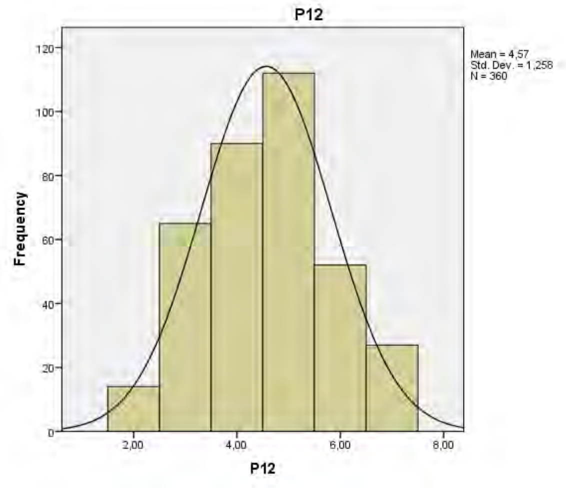

P7
Mean = 4,71
Std. Dev. = 1,223
N = 360
Frequency
P7

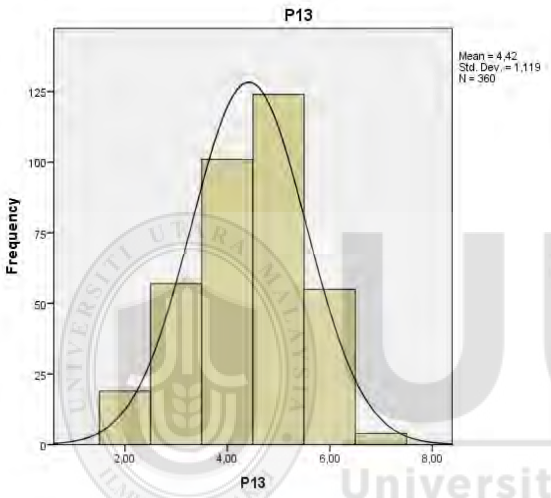

P8
Mean = 4,62
Std. Dev. = 1,357
N = 360
Frequency
P8

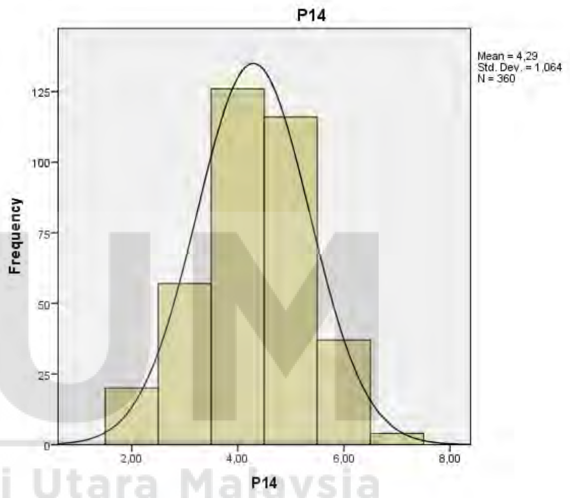

P9
Mean = 4,34
Std. Dev. = 1,113
N = 360
Frequency
P9

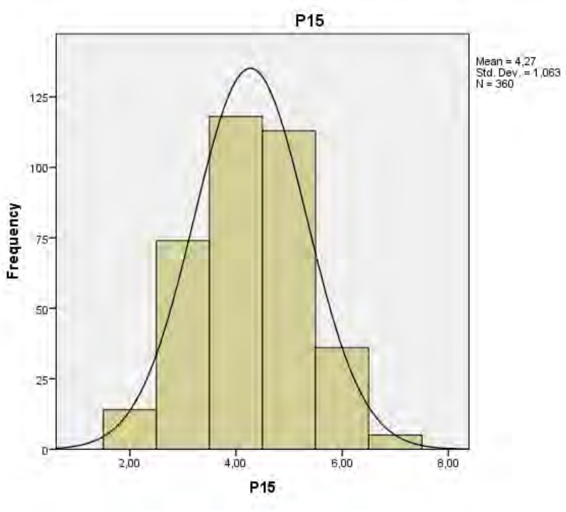

P10
Mean = 4,45
Std. Dev. = 1,103
N = 360
Frequency
P10

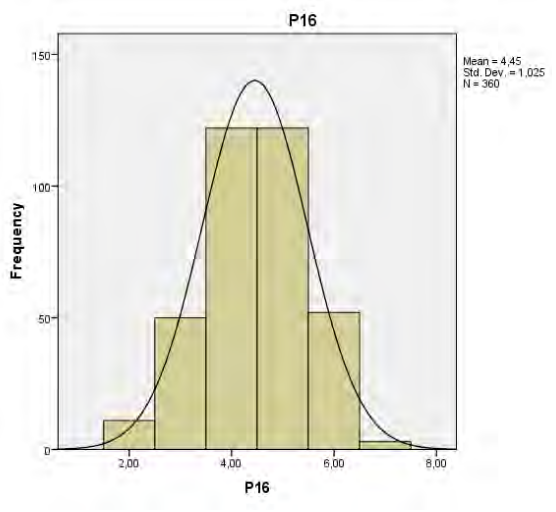

P11
Mean = 4,31
Std. Dev. = 1,09
N = 360
Frequency
0
25
50
75
100
125
1,00
2,00
3,00
4,00
5,00
6,00
7,00
P11

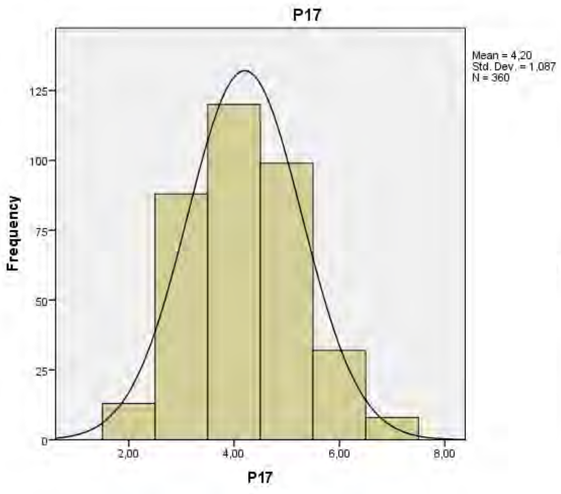

P12
Mean = 4,57
Std. Dev. = 1,258
N = 360
Frequency
0
20
40
60
80
100
120
2,00
4,00
6,00
8,00
P12

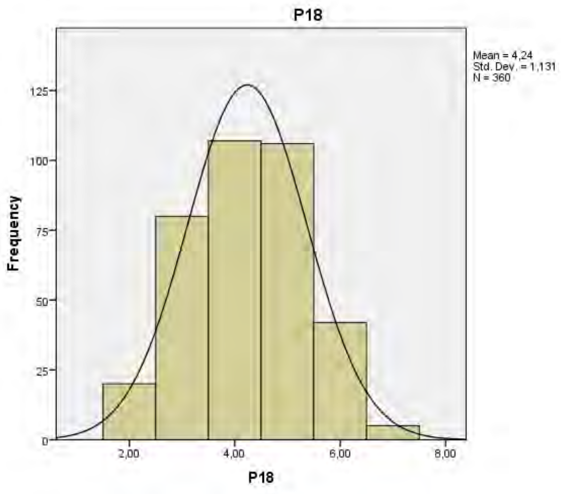

P13
Mean = 4,42
Std. Dev. = 1,119
N = 360
Frequency
0
25
50
75
100
125
2,00
4,00
6,00
8,00
P13

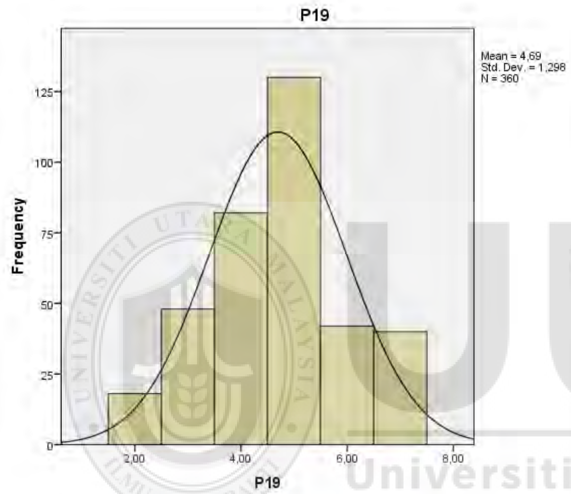

P14
Mean = 4,29
Std. Dev. = 1,064
N = 360
Frequency
0
25
50
75
100
125
2,00
4,00
6,00
8,00
P14

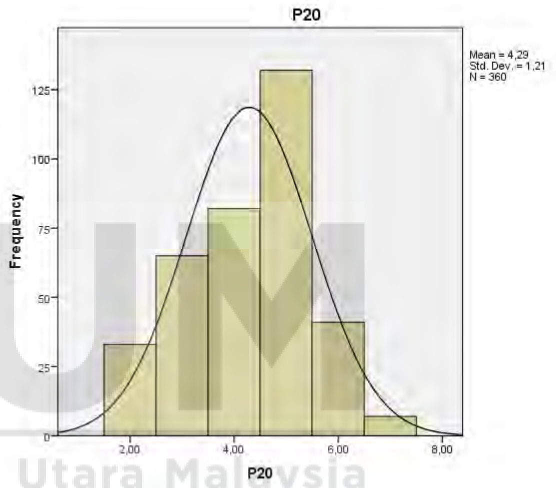

P15
Mean = 4,27
Std. Dev. = 1,063
N = 360
Frequency
0
25
50
75
100
125
2,00
4,00
6,00
8,00
P15

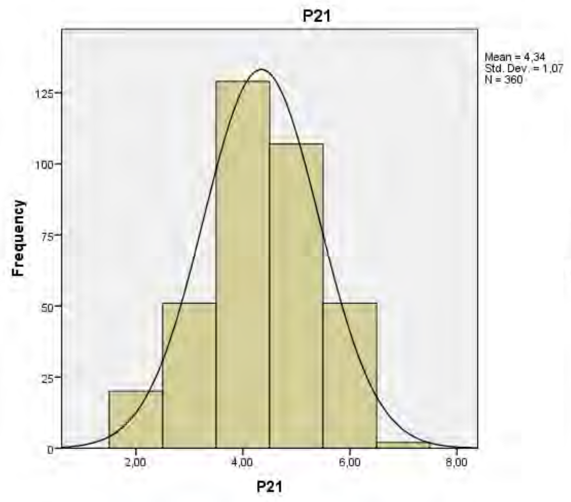

P16
Mean = 4,45
Std. Dev. = 1,025
N = 360
Frequency
0
50
100
150
2,00
4,00
6,00
8,00
P16

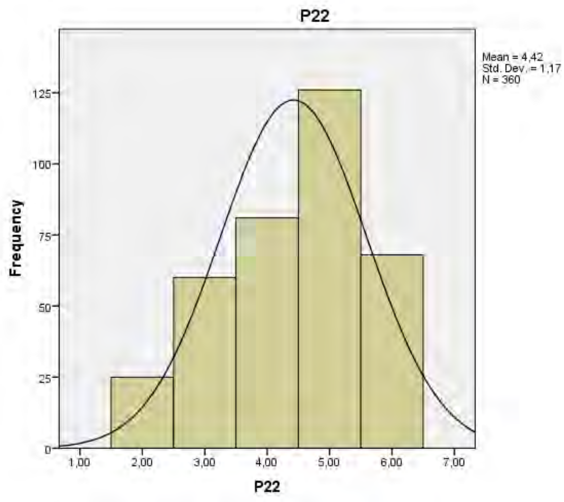

P17
Mean = 4,20
Std. Dev. = 1,087
N = 360
Frequency
P17

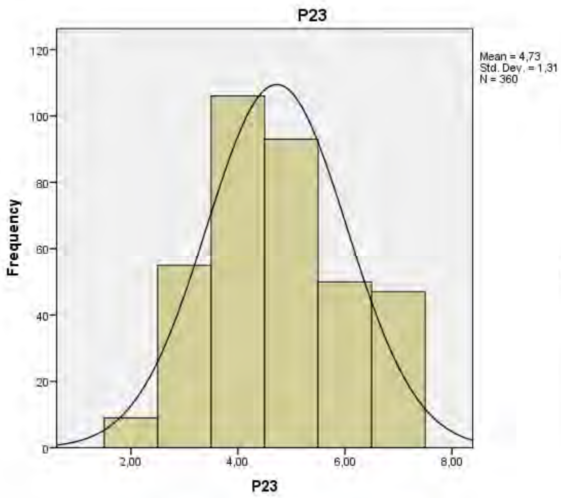

P18
Mean = 4,24
Std. Dev. = 1,131
N = 360
Frequency
P18

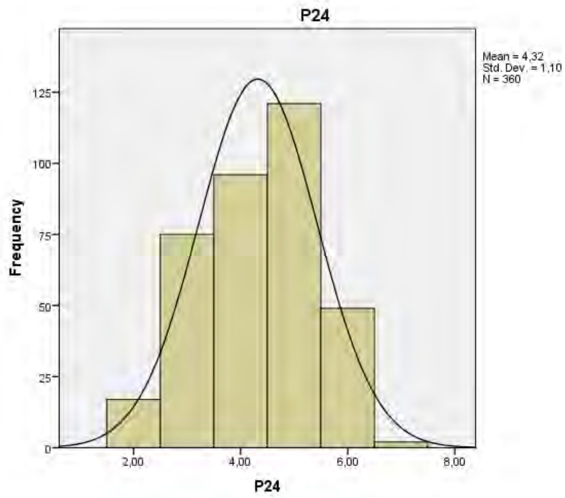

P19
Mean = 4,69
Std. Dev. = 1,298
N = 360
Frequency
P19

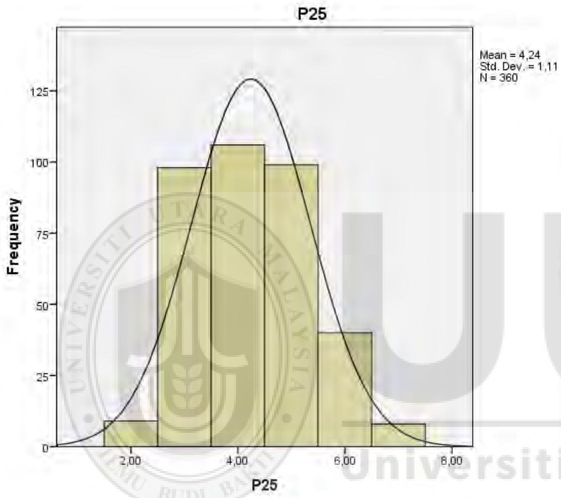

P20
Mean = 4,29
Std. Dev. = 1,21
N = 360
Frequency
P20

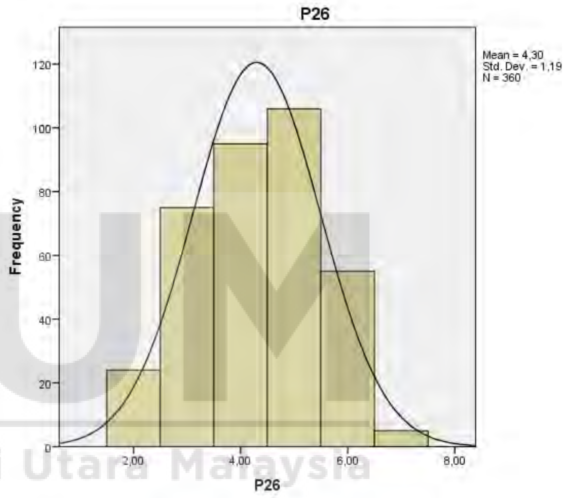

P21
Mean = 4,34
Std. Dev. = 1,07
N = 360
Frequency
P21

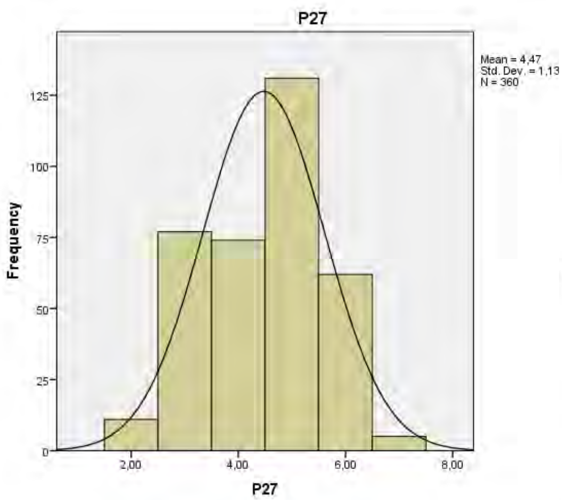

P22
Mean = 4,42
Std. Dev. = 1,17
N = 360
Frequency
P22

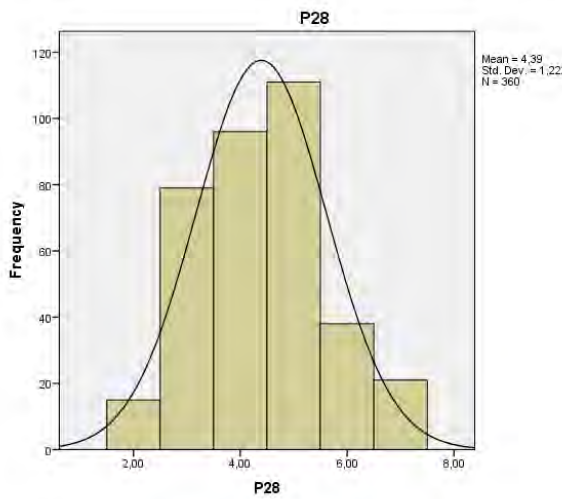

P23
Mean = 4,73
Std. Dev. = 1,31
N = 360
Frequency
P23

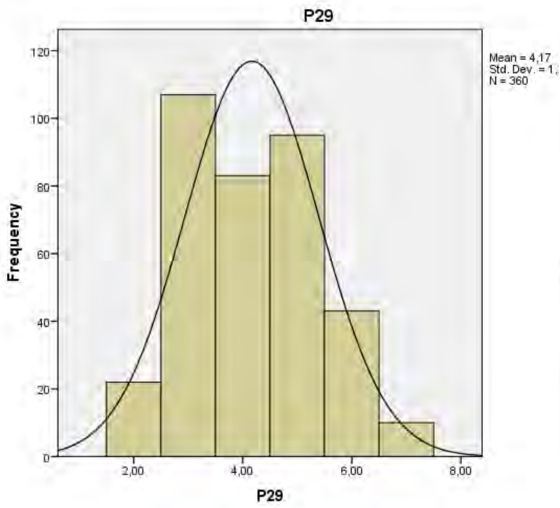

P24
Mean = 4,32
Std. Dev. = 1,10
N = 360
Frequency
P24

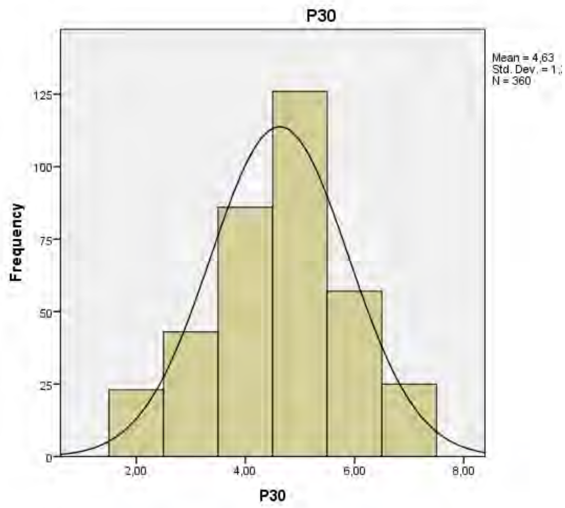

P25
Mean = 4,24
Std. Dev. = 1,11
N = 360
Frequency
P25

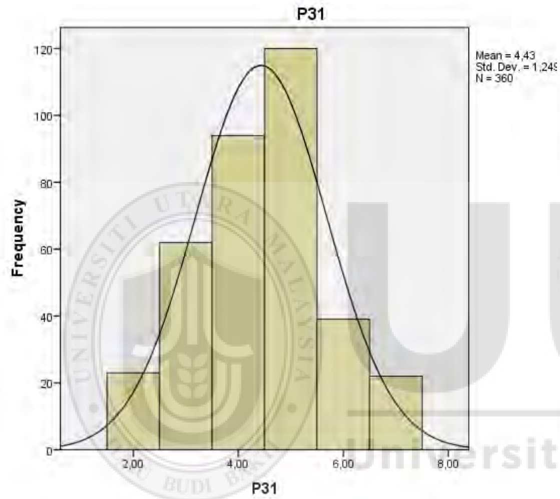

P26
Mean = 4,30
Std. Dev. = 1,19
N = 360
Frequency
P26

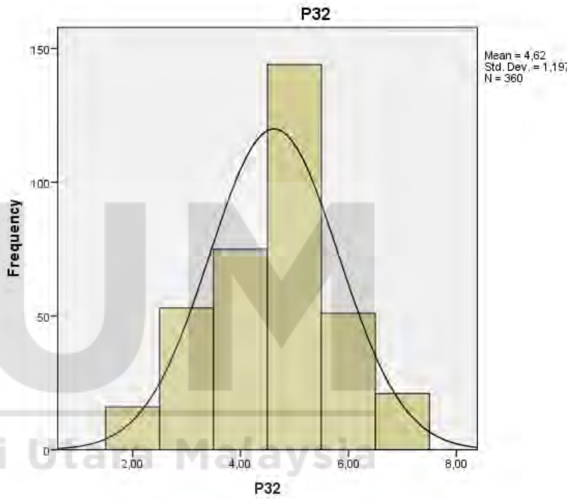

P27
Mean = 4,47
Std. Dev. = 1,13
N = 360
Frequency
P27

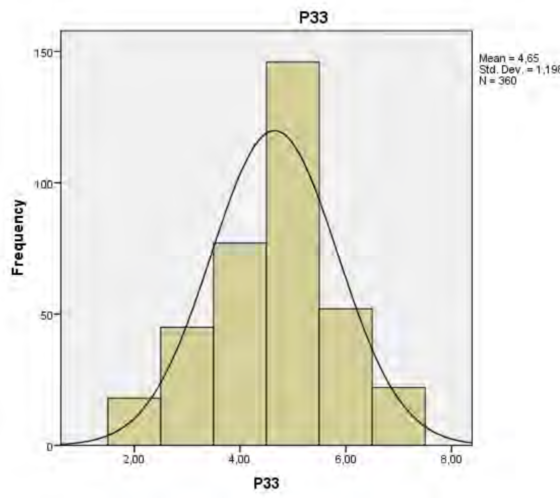

P28
Mean = 4,39
N = 360
Frequency
P28

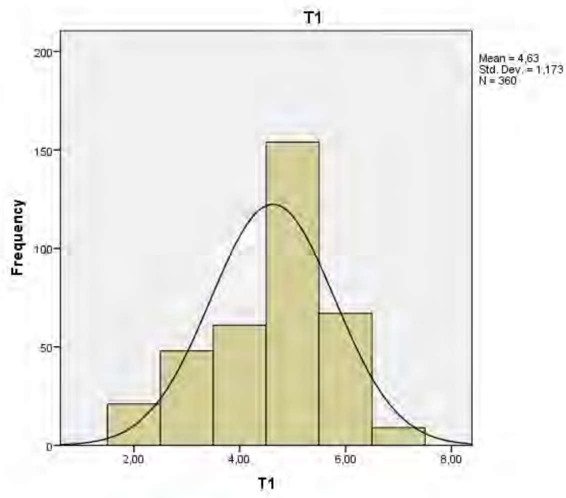

P29
Mean = 4,17
N = 360
Frequency
P29

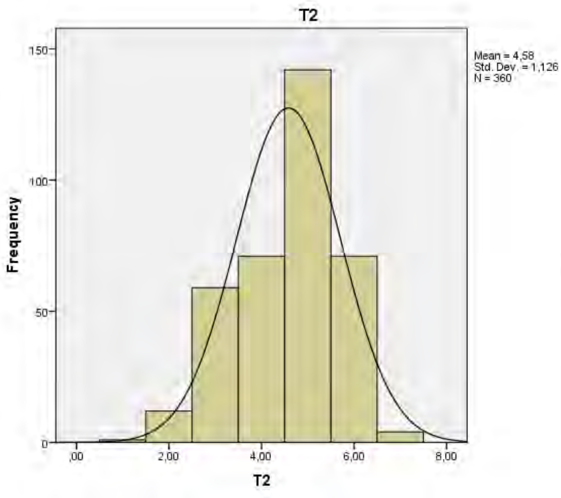

P30
Mean = 4,63
N = 360
Frequency
P30

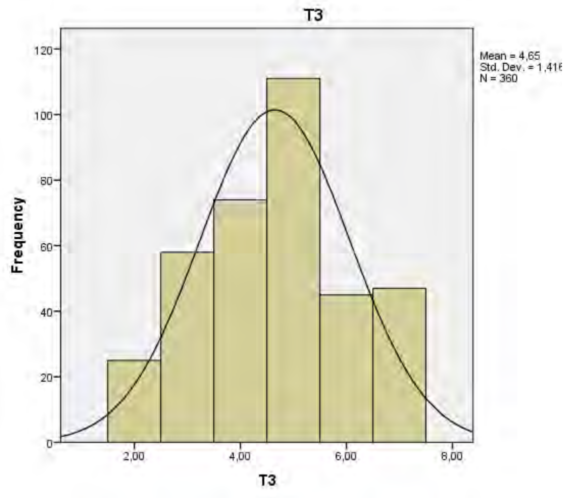

P31
Mean = 4,43
N = 360
Frequency
P31

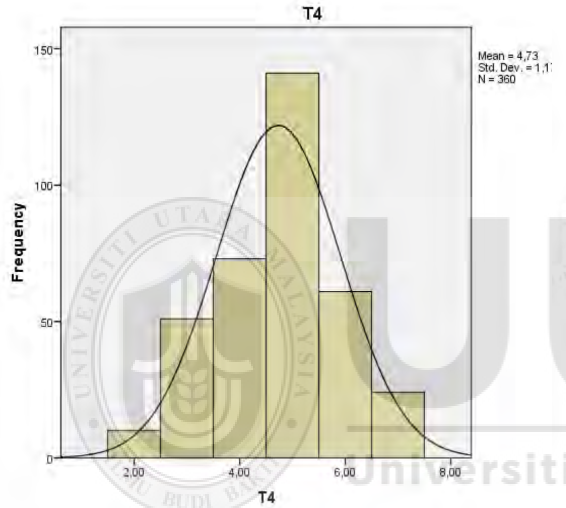

P32
Mean = 4,62
N = 360
Frequency
P32

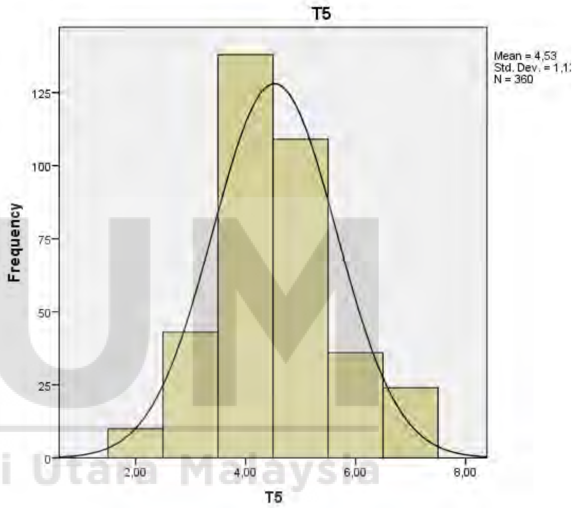

P33
Mean = 4,65
N = 360
Frequency
P33

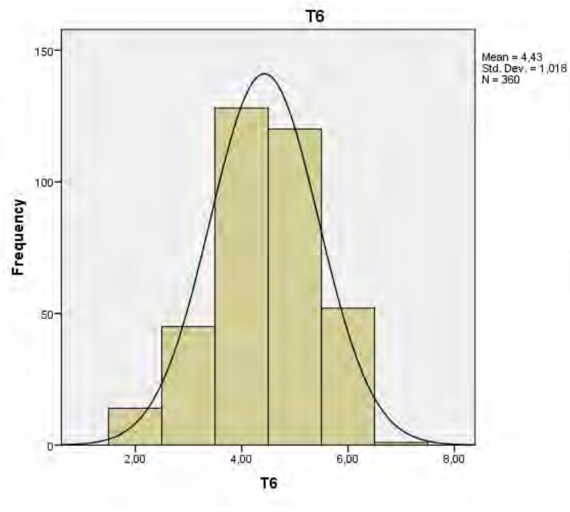

T1
Mean = 4,63
Std. Dev. = 1,173
N = 360
Frequency
T1

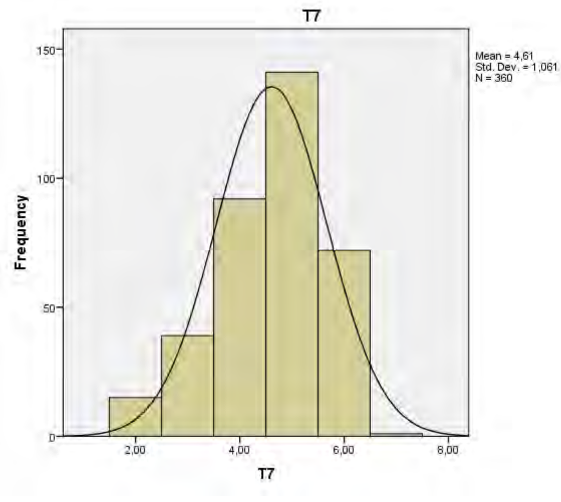

T2
Mean = 4,58
Std. Dev. = 1,126
N = 360
Frequency
0
50
100
150
,00
2,00
4,00
6,00
8,00
T2

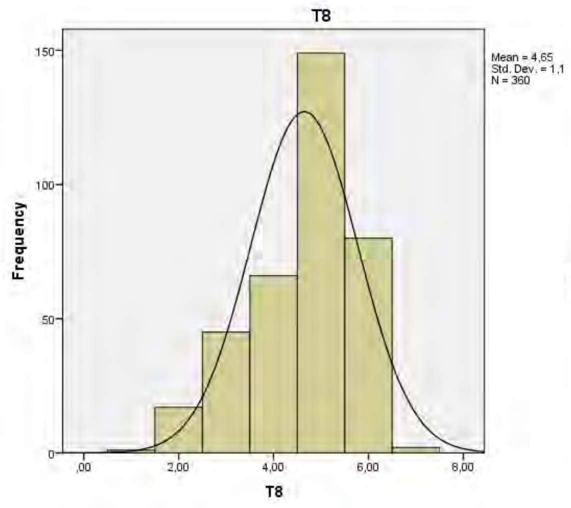

T3
Mean = 4,65
N = 360
Frequency
0
20
40
60
80
100
120
2,00
4,00
6,00
8,00
T3

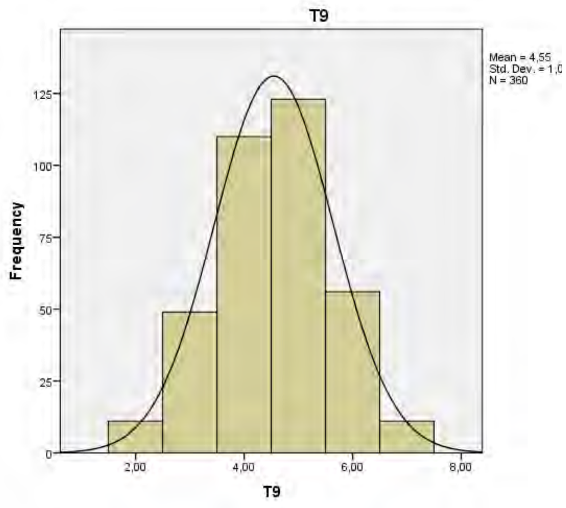

T4
Mean = 4,73
N = 360
Frequency
0
50
100
150
2,00
4,00
6,00
8,00
T4

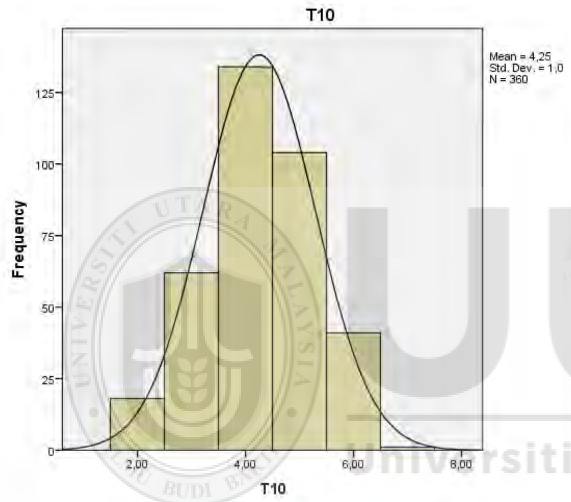

T5
Mean = 4,53
N = 360
Frequency
0
25
50
75
100
125
2,00
4,00
6,00
8,00
T5

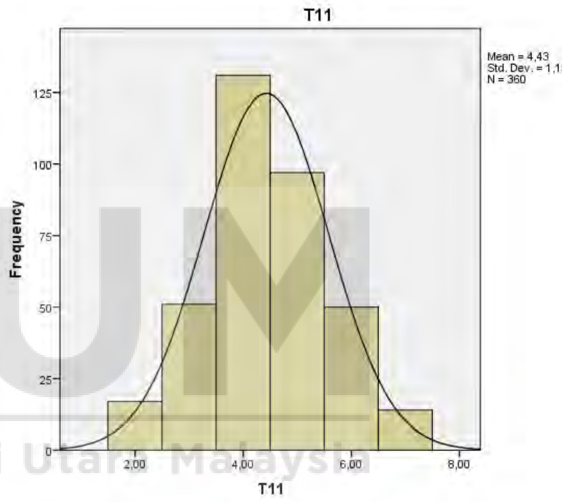

T6
Mean = 4,43
Std. Dev. = 1,018
N = 360
Frequency
0
50
100
150
2,00
4,00
6,00
8,00
T6

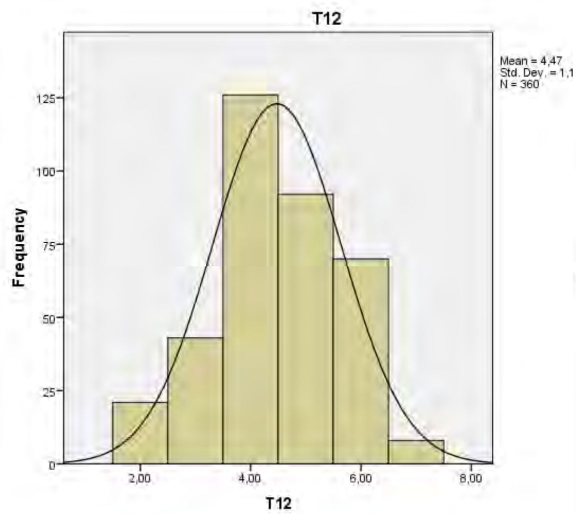

T7
Mean = 4,61
Std. Dev. = 1,061
N = 360
Frequency
0
50
100
150
2,00
4,00
6,00
8,00
T7

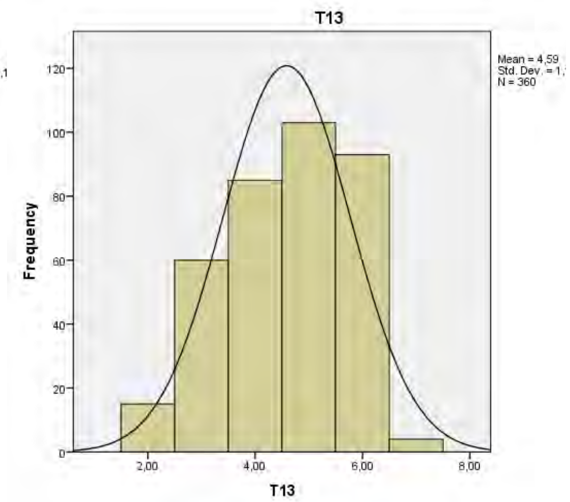

T8
Mean = 4,65
Std. Dev. = 1,1
N = 360
Frequency
T8

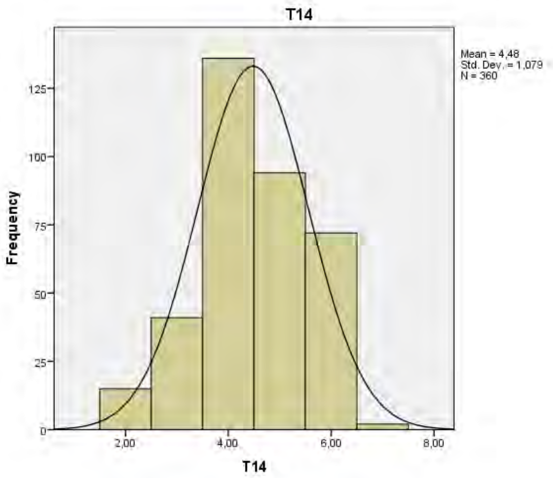

T9
Mean = 4,55
Std. Dev. = 1,0
N = 360
Frequency
T9

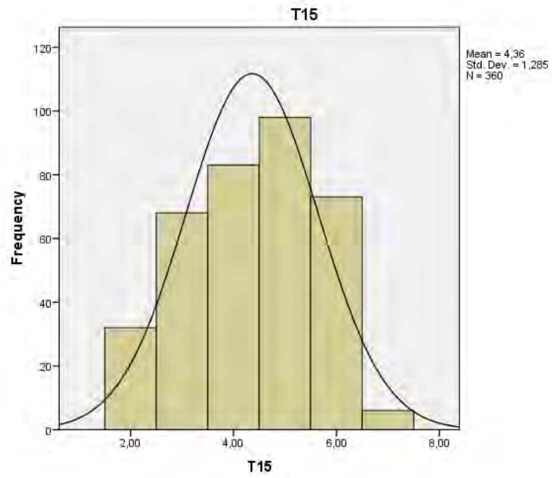

T10
Mean = 4,25
Std. Dev. = 1,0
N = 360
Frequency
T10

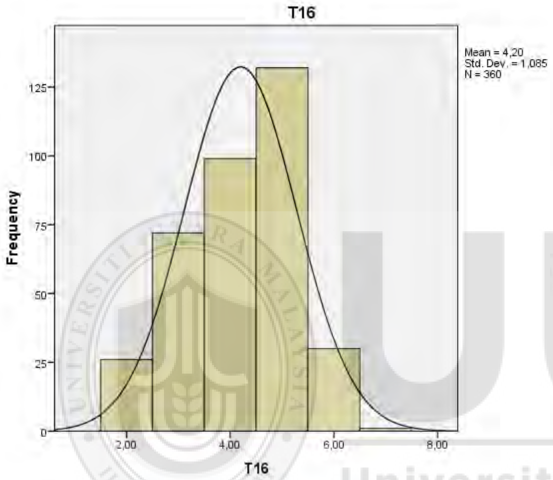

T11
Mean = 4,43
Std. Dev. = 1,1
N = 360
Frequency
T11

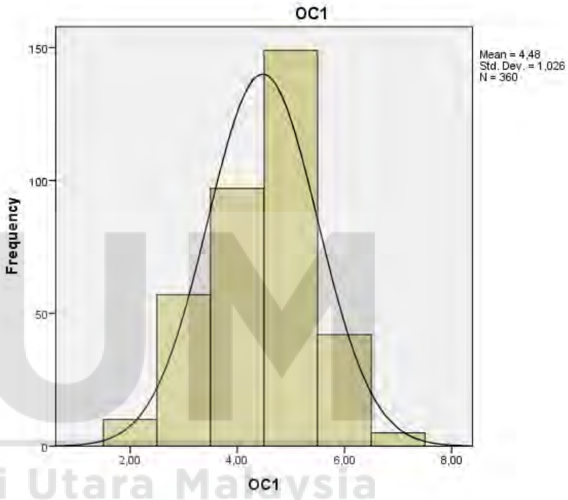

T12
Mean = 4,47
Std. Dev. = 1,1
N = 360
Frequency
T12

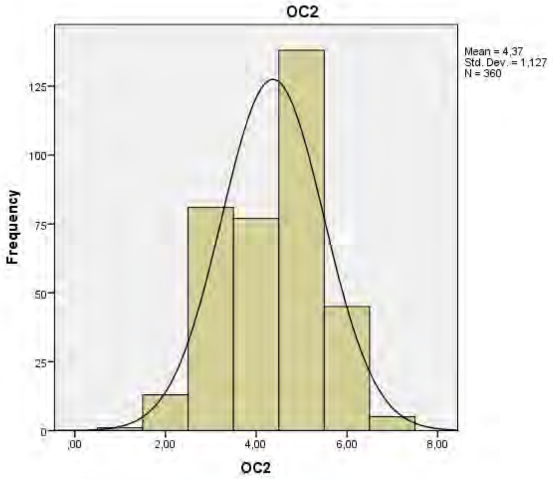

T13
Mean = 4,59
Std. Dev. = 1,
N = 360
Frequency
T13

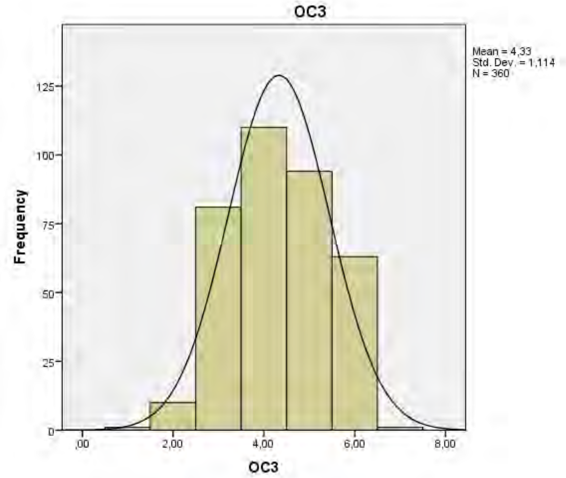

T14
Mean = 4,48
Std. Dev. = 1,079
N = 360
Frequency
T14

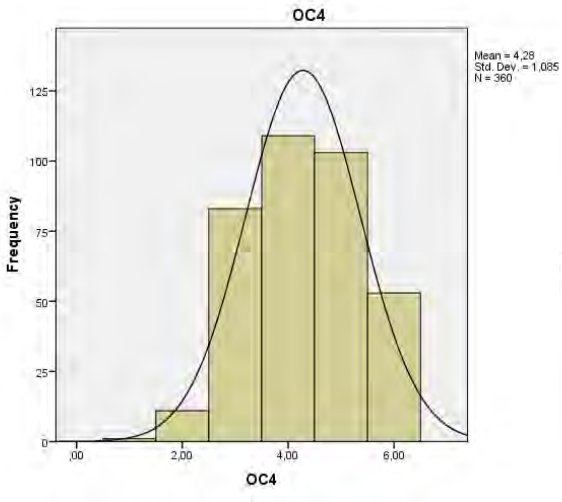

T15
Mean = 4,36
Std. Dev. = 1,285
N = 360
Frequency
T15

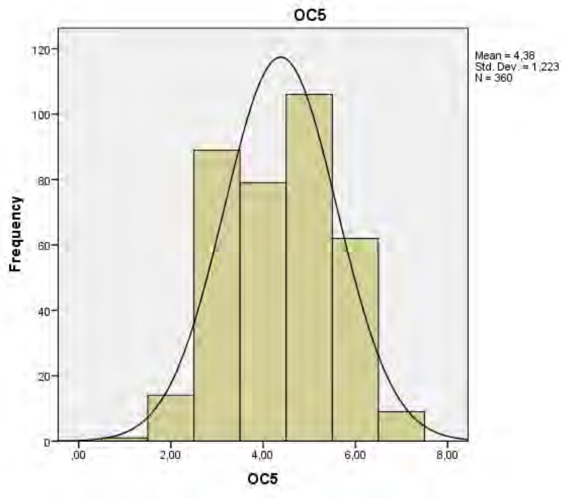

T16
Mean = 4,20
Std. Dev. = 1,085
N = 360
Frequency
T16

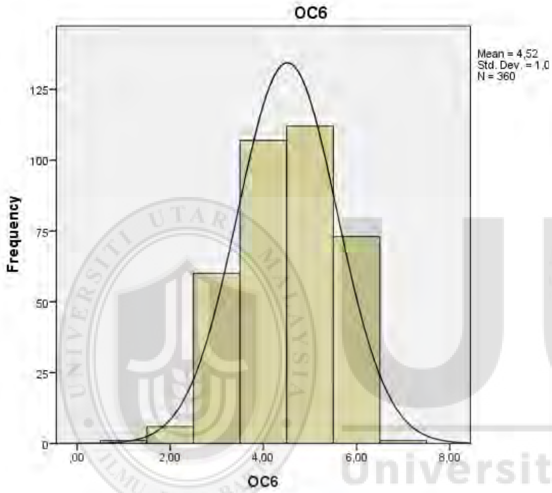

OC1
Mean = 4,48
Std. Dev. = 1,026
N = 360
Frequency
OC1

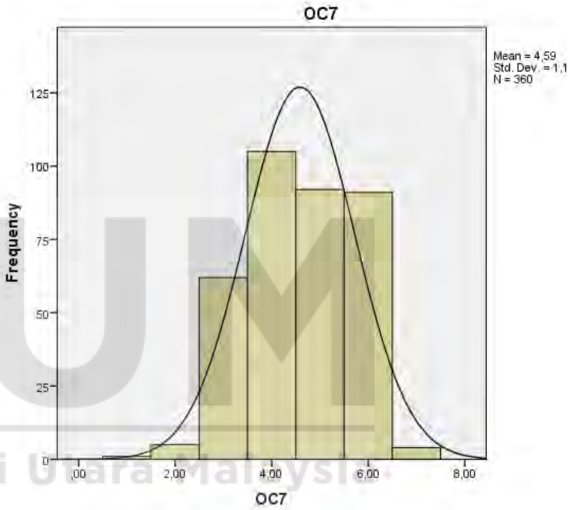

OC2
Mean = 4,37
Std. Dev. = 1,127
N = 360
Frequency
OC2

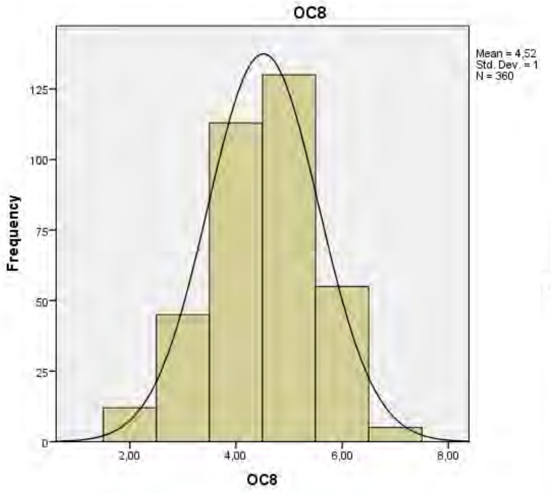

OC3
Mean = 4,33
Std. Dev. = 1,114
N = 360
Frequency
OC3

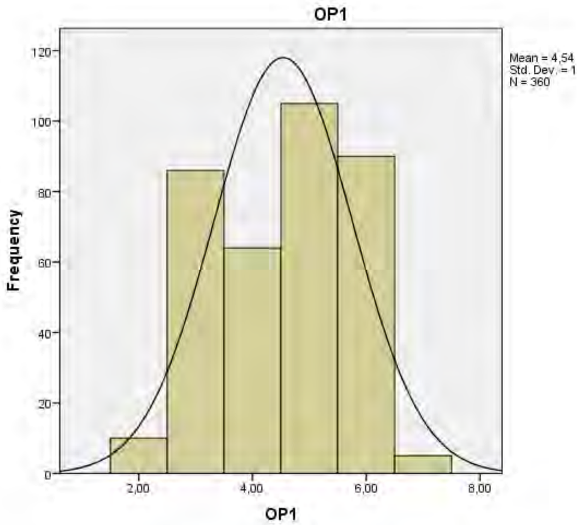

OC4
Mean = 4,28
Std. Dev. = 1,085
N = 360
Frequency
OC4

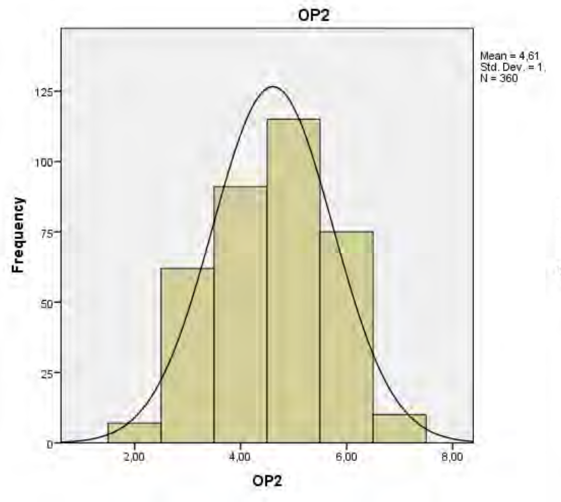

OC5
Mean = 4,38
Std. Dev. = 1,223
N = 360
Frequency
OC5

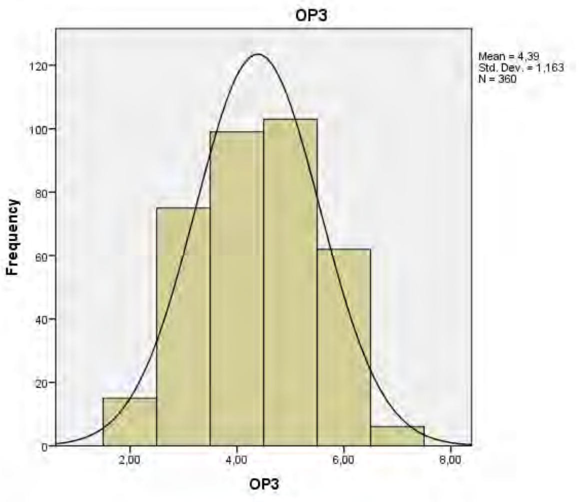

OC6
Mean = 4,52
N = 360
Frequency
OC6

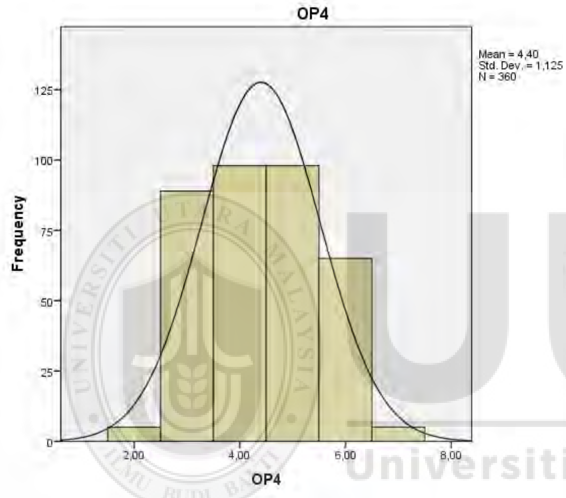

OC7
Mean = 4,59
N = 360
Frequency
OC7

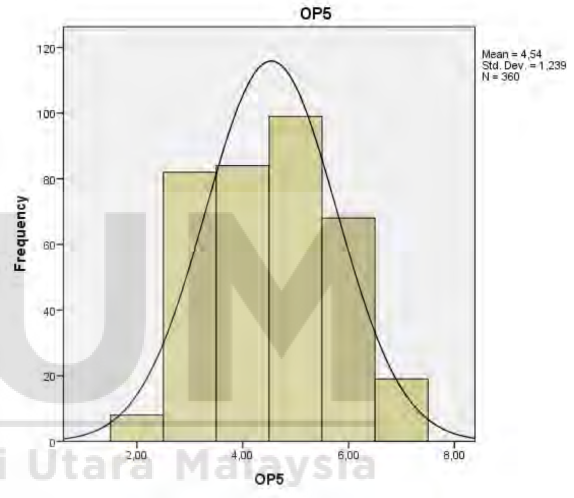

OC8
Mean = 4,52
N = 360
Frequency
OC8

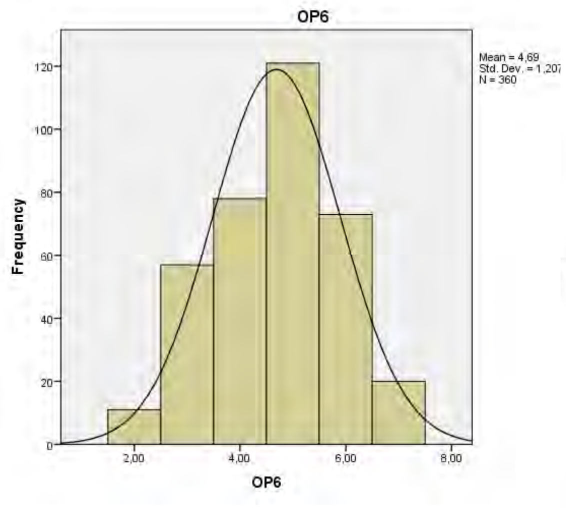

OP1
Mean = 4,54
N = 360
Frequency
OP1

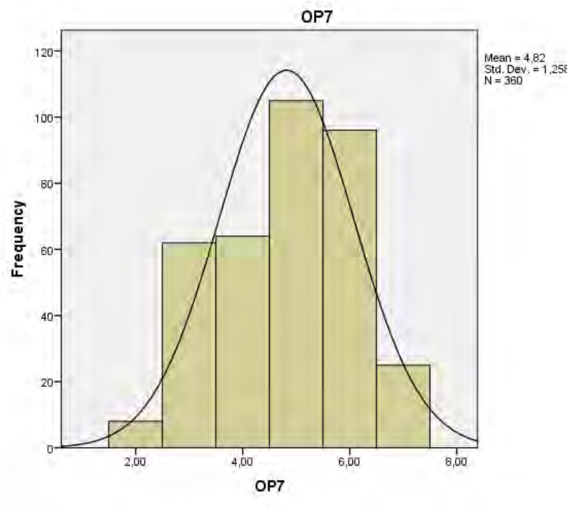

OP2
Mean = 4,61
Std. Dev. = 1,
N = 360
Frequency
OP2


OP3
Mean = 4,39
Std. Dev. = 1,163
N = 360
Frequency
OP3


OP4
Mean = 4,40
Std. Dev. = 1,125
N = 360
Frequency
OP4


OP5
Mean = 4,54
Std. Dev. = 1,239
N = 360
Frequency
OP5


OP6
Mean = 4,69
Std. Dev. = 1,207
N = 360
Frequency
OP6


OP7
Mean = 4,82
Std. Dev. = 1,258
N = 360
Frequency
OP7

Appendix E: Assessment of Normality

Assessment of normality (Group number 1)

Variable	min	max	skew	c.r.	kurtosis	c.r.
OP7	1.000	5.304	-.043	-.332	-.330	-1.280
OP6	1.000	5.279	-.028	-.213	-.260	-1.006
OP5	1.000	5.422	.031	.241	-.329	-1.272
OP4	1.000	6.104	.052	.399	-.339	-1.313
OP3	1.000	5.625	-.004	-.027	-.266	-1.031
OP2	1.000	5.729	-.018	-.136	-.238	-.920
OP1	1.000	5.850	-.047	-.366	-.362	-1.402
OC8	1.000	5.779	-.033	-.257	-.122	-.473
OC7	1.000	6.702	-.086	-.662	-.292	-1.132
OC6	1.000	7.146	-.109	-.843	-.333	-1.289
OC5	1.000	6.411	.001	.011	-.187	-.726
OC4	1.000	5.637	-.086	-.662	-.421	-1.631
OC3	1.000	7.146	-.060	-.466	-.320	-1.240
OC2	1.000	6.625	-.026	-.205	-.076	-.295
OC1	1.000	5.850	-.037	-.289	-.056	-.216
TECH1	1.419	5.234	.066	.514	-.661	-2.559
TECH2	1.267	4.951	.033	.256	-.122	-.473
TECH3	1.000	4.902	.170	1.318	1.225	4.743
PPS1	1.114	4.544	.122	.942	-.051	-.197
PPS2	1.000	4.549	.023	.179	-.006	-.021
PPS3	1.000	4.767	.006	.046	-.208	-.804
PPS4	1.000	4.769	.163	1.260	-.034	-.133
PPS5	1.459	4.454	.009	.073	-.477	-1.849
HRC1	1.229	4.627	-.113	-.875	-.418	-1.618
HRC2	1.226	4.901	.196	1.519	-.610	-2.362
HRC3	1.317	5.299	.114	.884	-.267	-1.036
HRC4	1.000	5.760	.060	.464	-.254	-.986
HRC5	1.393	5.409	-.164	-1.270	-.085	-.330
Multivariate					118.607	27.452

Appendix F: Linearity and Homoscedasticity

Observations farthest from the centroid (Mahalanobis distance) (Group number 1)

Observation number	Mahalanobis d-squared	p1	p2
233	82.135	.000	.000
360	78.255	.000	.000
282	65.030	.000	.000
34	64.062	.000	.000
231	60.255	.000	.000
306	58.962	.001	.000
318	58.757	.001	.000
316	56.573	.001	.000
278	55.240	.002	.000
321	54.718	.002	.000
38	54.371	.002	.000
161	54.305	.002	.000
308	53.644	.002	.000
254	53.202	.003	.000
309	53.118	.003	.000
5	53.076	.003	.000
271	52.892	.003	.000
241	52.790	.003	.000
279	51.158	.005	.000
305	51.056	.005	.000
335	50.675	.005	.000
31	50.568	.006	.000
247	50.125	.006	.000
329	49.448	.007	.000
317	49.302	.008	.000
273	49.201	.008	.000
349	49.162	.008	.000
347	49.140	.008	.000
10	48.956	.008	.000
246	48.831	.009	.000
11	48.561	.009	.000
345	48.509	.009	.000
6	48.419	.010	.000
176	47.484	.012	.000
26	47.456	.012	.000
132	47.352	.013	.000
237	47.322	.013	.000
352	47.319	.013	.000
65	46.855	.014	.000
257	46.443	.016	.000
174	45.706	.019	.000
22	45.413	.020	.000
357	45.061	.022	.000
43	44.994	.022	.000
69	44.809	.023	.000
267	44.294	.026	.000
353	44.274	.026	.000
14	44.199	.027	.000

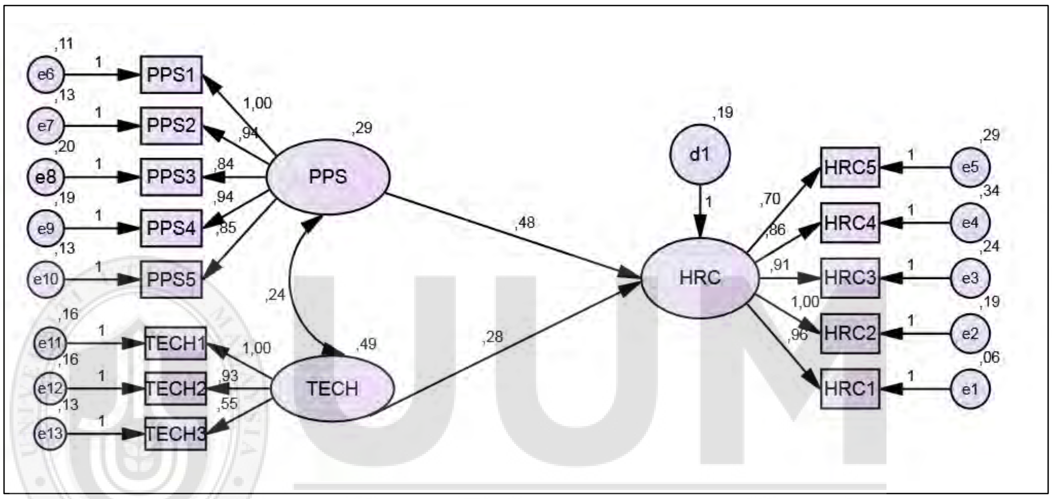
Observation number	Mahalanobis d-squared	p1	p2
39	43.368	.032	.000
274	43.357	.032	.000
4	43.305	.033	.000
252	42.932	.035	.000
32	42.784	.037	.000
272	42.734	.037	.000
312	42.626	.038	.000
310	42.350	.040	.000
298	42.238	.041	.000
262	42.070	.043	.000
265	42.067	.043	.000
20	42.059	.043	.000
71	41.621	.047	.000
8	41.377	.050	.000
30	40.988	.054	.000
256	40.750	.057	.000
311	40.544	.059	.000
248	40.462	.060	.000
123	40.087	.065	.000
19	39.853	.068	.000
186	39.792	.069	.000
131	39.792	.069	.000
288	39.702	.070	.000
259	38.956	.082	.000
9	38.868	.083	.000
55	38.577	.088	.000
255	38.511	.089	.000
325	38.245	.094	.000
36	38.239	.094	.000
100	38.115	.096	.000
260	38.073	.097	.000
277	37.802	.102	.000
276	37.454	.109	.000
333	37.306	.112	.000
45	36.905	.121	.000
204	36.486	.131	.000
342	36.366	.134	.000
18	36.115	.140	.000
313	36.051	.141	.000
348	36.001	.143	.000
1	35.971	.143	.000
268	35.619	.153	.000
344	35.537	.155	.000
41	35.423	.158	.000
63	35.240	.163	.000
338	35.073	.168	.000
29	35.048	.168	.000
27	34.840	.175	.000
280	34.807	.176	.000
17	34.543	.184	.000
295	34.456	.186	.000
253	34.391	.188	.000

Appendix G: Variance Inflation Factor (VIF)

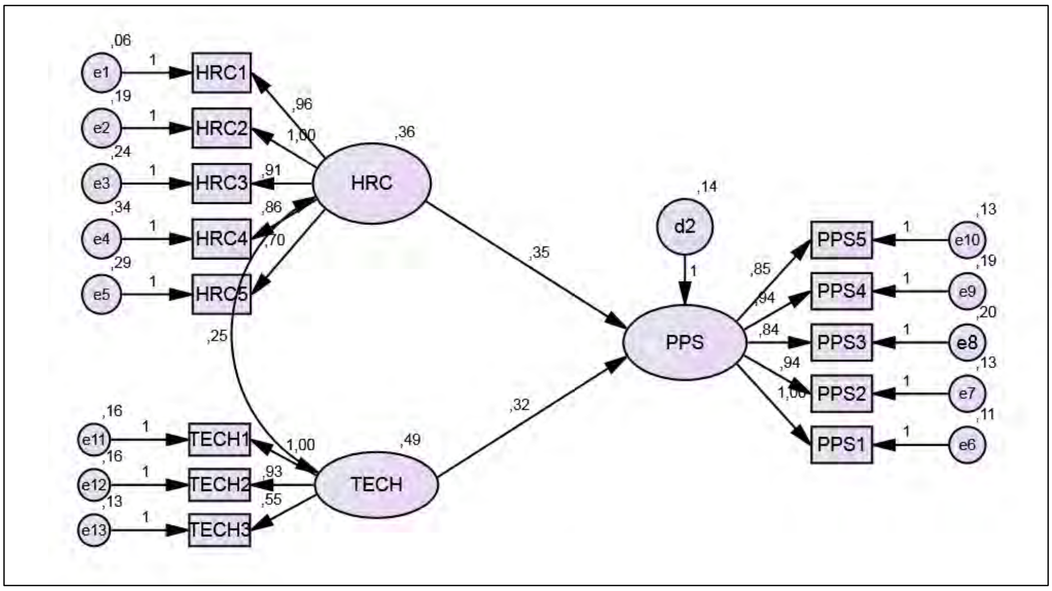
G.1 Assessment Multi co-linearity

Variable Latent Exogenous	R-Square	Tolerance	VIF
HRC	0.479	0.521	1.919
PPS	0.524	0.476	2.101
TECH	0.486	0.514	1.946

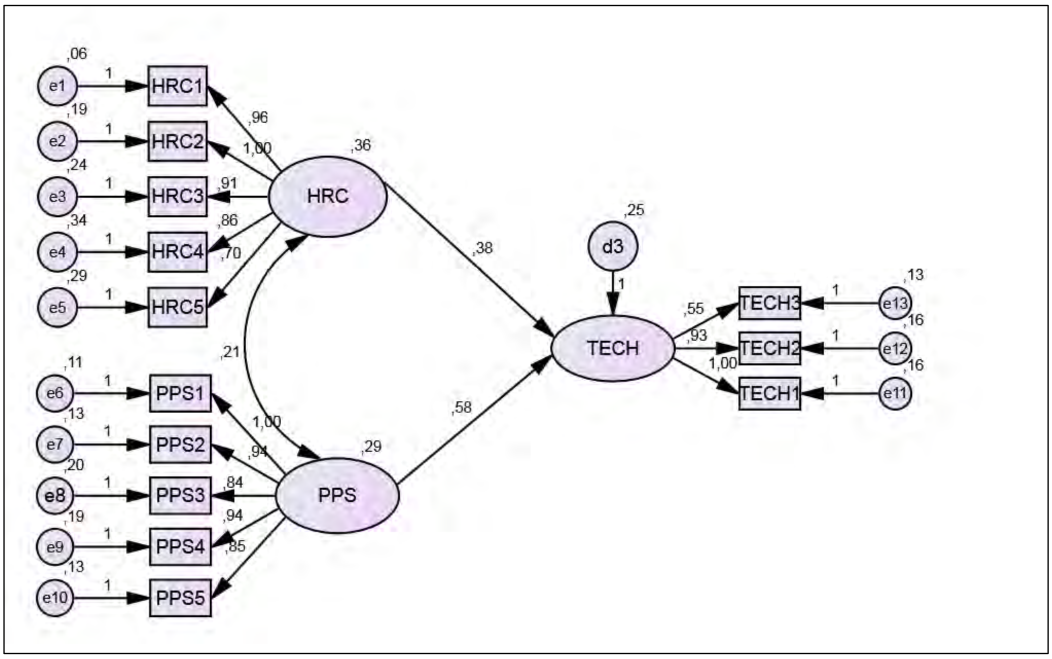
Tolerance > 0.10; VIF < 10



	Estimate
HRC	.479
TECH1	.757
TECH2	.727
TECH3	.529
PPS1	.718
PPS2	.660
PPS3	.498
PPS4	.566
PPS5	.609
HRC1	.841
HRC2	.654
HRC3	.551
HRC4	.440
HRC5	.376



	Estimate
PPS	.524
TECH1	.757
TECH2	.727
TECH3	.529
PPS1	.718
PPS2	.660
PPS3	.498
PPS4	.566
PPS5	.609
HRC1	.841
HRC2	.654
HRC3	.551
HRC4	.440
HRC5	.376



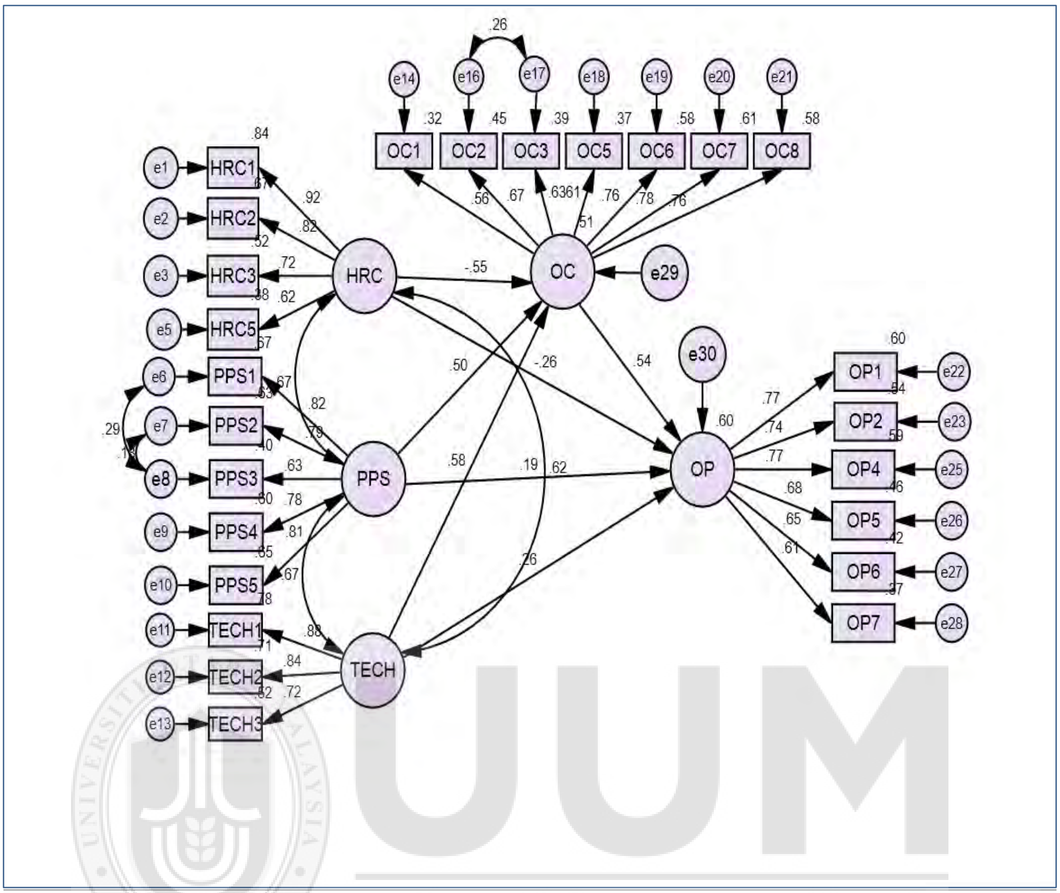
	Estimate
TECH	.486
TECH1	.757
TECH2	.727
TECH3	.529
PPS1	.718
PPS2	.660
PPS3	.498
PPS4	.566
PPS5	.609
HRC1	.841
HRC2	.654
HRC3	.551
HRC4	.440
HRC5	.376

G.2 Direct Hypothesis Testing Results All Items

Exogenous		Std. Estimate	S.E	C.R	P	Result
HRC	HRC1	0.914	0.047	20.385	***	Support
	HRC2	0.812				Support
	HRC3	0.742	0.059	15.316	***	Support
	HRC4	0.660	0.065	13.165	***	Support
	HRC5	0.619	0.057	12.269	***	Support
PPS	PPS1	0.843				Support
	PPS2	0.807	0.053	17.917	***	Support
	PPS3	0.701	0.056	14.933	***	Support
	PPS4	0.764	0.059	16.247	***	Support
	PPS5	0.784	0.051	16.778	***	Support
TECH	TECH1	0.879				Support
	TECH1	0.844	0.036	15.285	***	Support
	TECH1	0.725	0.048	18.771	***	Support
OC	OC1	0.573	0.070	10.743	***	Support
	OC2	0.702	0.070	13.212	***	Support
	OC3	0.682	0.070	12.784	***	Support
	OC4	0.657	0.070	12.332	***	Support
	OC5	0.633	0.071	11.862	***	Support
	OC6	0.755	0.068	14.593	***	Support
	OC7	0.765				Support
	OC8	0.739	0.068	14.290	***	Support
OP	OP1	0.573	0.063	14.884	***	Support
	OP2	0.702	0.063	14.877	***	Support
	OP3	0.682	0.062	15.914	***	Support
	OP4	0.657				Support
	OP5	0.633	0.066	12.638	***	Support
	OP6	0.755	0.067	12.279	***	Support
	OP7	0.765	0.066	11.544	***	Support

Appendix H: Final Model

H.1 Results of Analysis



H.2 CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	63	691.766	262	.000	2.640
Saturated model	325	.000	0		
Independence model	25	5280.921	300	.000	17.603

H3. RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.041	.866	.834	.698
Saturated model	.000	1.000		
Independence model	.242	.245	.182	.226

H.4 Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.869	.850	.914	.901	.914
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

H.5 RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.068	.061	.074	.000
Independence model	.215	.210	.220	.000

H.6 Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
OC	<---	HRC	-.670	.100	-6.692	***	par_18
OC	<---	PPS	.752	.135	5.585	***	par_20
OC	<---	TECH	.606	.086	7.018	***	par_22
OP	<---	HRC	-.312	.104	-2.989	.003	par_19
OP	<---	PPS	.283	.131	2.163	.031	par_21
OP	<---	TECH	.266	.089	2.998	.003	par_23
OP	<---	OC	.528	.081	6.491	***	par_24
HRC5	<---	HRC	.692	.057	12.244	***	par_1
HRC3	<---	HRC	.874	.059	14.902	***	par_2
HRC2	<---	HRC	1.000				
PPS5	<---	PPS	.958	.059	16.125	***	par_3
PPS4	<---	PPS	1.052	.068	15.423	***	par_4
PPS3	<---	PPS	.818	.062	13.149	***	par_5
PPS2	<---	PPS	1.000				
TECH3	<---	TECH	.540	.035	15.295	***	par_6
TECH2	<---	TECH	.900	.048	18.831	***	par_7
TECH1	<---	TECH	1.000				
OC1	<---	OC	.721	.069	10.516	***	par_8
OC2	<---	OC	.867	.069	12.619	***	par_9
OC5	<---	OC	.793	.069	11.429	***	par_10
OC6	<---	OC	.980	.066	14.786	***	par_11
OC7	<---	OC	1.000				
OC8	<---	OC	.983	.067	14.772	***	par_12
OP1	<---	OP	1.006	.069	14.545	***	par_13
OP2	<---	OP	.969	.069	14.019	***	par_14
OP4	<---	OP	1.000				
OP5	<---	OP	.890	.071	12.551	***	par_15
OP6	<---	OP	.854	.072	11.835	***	par_16
OP7	<---	OP	.798	.071	11.214	***	par_17
HRC1	<---	HRC	.954	.047	20.159	***	par_25
OC3	<---	OC	.809	.069	11.747	***	par_26
PPS1	<---	PPS	1.049	.063	16.708	***	par_27

H.7 Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
OC	.512
OP	.600
PPS1	.666
OC3	.394
HRC1	.844
OP7	.366
OP6	.419
OP5	.456
OP4	.587
OP2	.543
OP1	.595
OC8	.581
OC7	.605
OC6	.583
OC5	.373
OC2	.452
OC1	.315
TECH1	.780
TECH2	.705
TECH3	.523
PPS2	.625
PPS3	.401
PPS4	.602
PPS5	.653
HRC2	.670
HRC3	.517
HRC5	.382

H8. Total Effects (Group number 1 - Default model)

	TECH	PPS	HRC	OC	OP
OC	.606	.752	-.670	.000	.000
OP	.586	.681	-.666	.528	.000
PPS1	.000	1.049	.000	.000	.000
OC3	.490	.608	-.542	.809	.000
HRC1	.000	.000	.954	.000	.000
OP7	.468	.543	-.531	.421	.798
OP6	.501	.582	-.569	.451	.854
OP5	.522	.606	-.592	.470	.890
OP4	.586	.681	-.666	.528	1.000
OP2	.568	.660	-.645	.512	.969
OP1	.590	.685	-.670	.532	1.006
OC8	.596	.740	-.659	.983	.000
OC7	.606	.752	-.670	1.000	.000
OC6	.594	.737	-.656	.980	.000
OC5	.481	.597	-.531	.793	.000
OC2	.526	.652	-.581	.867	.000
OC1	.437	.543	-.483	.721	.000

	TECH	PPS	HRC	OC	OP
TECH1	1.000	.000	.000	.000	.000
TECH2	.900	.000	.000	.000	.000
TECH3	.540	.000	.000	.000	.000
PPS2	.000	1.000	.000	.000	.000
PPS3	.000	.818	.000	.000	.000
PPS4	.000	1.052	.000	.000	.000
PPS5	.000	.958	.000	.000	.000
HRC2	.000	.000	1.000	.000	.000
HRC3	.000	.000	.874	.000	.000
HRC5	.000	.000	.692	.000	.000

H.9 Total Effects - Standard Errors (Group number 1 - Default model)

	TECH	PPS	HRC	OC	OP
OC	.103	.160	.120	.000	.000
OP	.103	.147	.123	.104	.000
PPS1	.000	.063	.000	.000	.000
OC3	.090	.136	.107	.068	.000
HRC1	.000	.000	.043	.000	.000
OP7	.088	.124	.097	.085	.068
OP6	.092	.130	.098	.088	.076
OP5	.094	.138	.110	.087	.075
OP4	.103	.147	.123	.104	.000
OP2	.100	.150	.120	.095	.071
OP1	.102	.153	.120	.098	.068
OC8	.097	.157	.118	.057	.000
OC7	.103	.160	.120	.000	.000
OC6	.097	.165	.124	.061	.000
OC5	.085	.137	.108	.067	.000
OC2	.086	.146	.109	.065	.000
OC1	.078	.121	.088	.067	.000
TECH1	.000	.000	.000	.000	.000
TECH2	.059	.000	.000	.000	.000
TECH3	.044	.000	.000	.000	.000
PPS2	.000	.000	.000	.000	.000
PPS3	.000	.058	.000	.000	.000
PPS4	.000	.071	.000	.000	.000
PPS5	.000	.072	.000	.000	.000
HRC2	.000	.000	.000	.000	.000
HRC3	.000	.000	.067	.000	.000
HRC5	.000	.000	.063	.000	.000

H.11 Total Effects - Lower Bounds (BC) (Group number 1 - Default model)

	TECH	PPS	HRC	OC	OP
OC	.409	.482	-.939	.000	.000
OP	.369	.427	-.920	.332	.000
PPS1	.000	.935	.000	.000	.000
OC3	.324	.388	-.779	.675	.000
HRC1	.000	.000	.874	.000	.000
OP7	.289	.331	-.743	.266	.668
OP6	.316	.358	-.780	.289	.714
OP5	.331	.371	-.832	.307	.761
OP4	.369	.427	-.920	.332	1.000
OP2	.368	.410	-.911	.337	.843
OP1	.379	.424	-.924	.347	.888
OC8	.403	.468	-.907	.876	.000
OC7	.409	.482	-.939	1.000	.000
OC6	.408	.464	-.931	.864	.000
OC5	.324	.374	-.765	.664	.000
OC2	.360	.410	-.821	.743	.000
OC1	.290	.346	-.684	.586	.000
TECH1	1.000	.000	.000	.000	.000
TECH2	.791	.000	.000	.000	.000
TECH3	.459	.000	.000	.000	.000
PPS2	.000	1.000	.000	.000	.000
PPS3	.000	.701	.000	.000	.000
PPS4	.000	.927	.000	.000	.000
PPS5	.000	.826	.000	.000	.000
HRC2	.000	.000	1.000	.000	.000
HRC3	.000	.000	.746	.000	.000
HRC5	.000	.000	.571	.000	.000

H.12 Total Effects - Upper Bounds (BC) (Group number 1 - Default model)

	TECH	PPS	HRC	OC	OP
OC	.821	1.105	-.463	.000	.000
OP	.781	1.003	-.444	.745	.000
PPS1	.000	1.183	.000	.000	.000
OC3	.676	.918	-.361	.950	.000
HRC1	.000	.000	1.044	.000	.000
OP7	.640	.815	-.363	.601	.939
OP6	.680	.869	-.394	.633	1.009
OP5	.707	.914	-.398	.651	1.057
OP4	.781	1.003	-.444	.745	1.000
OP2	.763	.995	-.436	.710	1.126
OP1	.785	1.017	-.453	.733	1.158
OC8	.788	1.081	-.450	1.100	.000
OC7	.821	1.105	-.463	1.000	.000
OC6	.789	1.103	-.442	1.104	.000
OC5	.663	.903	-.342	.924	.000
OC2	.704	.984	-.396	1.001	.000
OC1	.599	.811	-.335	.849	.000
TECH1	1.000	.000	.000	.000	.000
TECH2	1.019	.000	.000	.000	.000
TECH3	.629	.000	.000	.000	.000
PPS2	.000	1.000	.000	.000	.000
PPS3	.000	.936	.000	.000	.000
PPS4	.000	1.206	.000	.000	.000
PPS5	.000	1.111	.000	.000	.000
HRC2	.000	.000	1.000	.000	.000
HRC3	.000	.000	1.010	.000	.000
HRC5	.000	.000	.816	.000	.000

H.13 Total Effects - Two Tailed Significance (BC) (Group number 1 - Default model)

	TECH	PPS	HRC	OC	OP
OC	.000	.000	.000	...	...
OP	.000	.000	.000	.000	...
PPS1	...	.000	...	...	...
OC3	.000	.000	.000	.000	...
HRC1	...	...	.000	...	...
OP7	.000	.000	.000	.000	.000
OP6	.000	.000	.000	.000	.000
OP5	.000	.000	.000	.000	.000
OP4	.000	.000	.000	.000	...
OP2	.000	.000	.000	.000	.000
OP1	.000	.000	.000	.000	.000
OC8	.000	.001	.000	.001	...
OC7	.000	.000	.000	...	...
OC6	.000	.000	.000	.000	...
OC5	.000	.000	.000	.000	...
OC2	.000	.000	.000	.000	...
OC1	.000	.000	.000	.000	...
TECH1	...	...	...	...	...
TECH2	.000	...	...	...	...
TECH3	.000	...	...	...	...
PPS2	...	...	...	...	...
PPS3	...	.000	...	...	...
PPS4	...	.000	...	...	...
PPS5	...	.000	...	...	...
HRC2	...	...	...	...	...
HRC3	...	...	.000	...	...
HRC5	...	...	.000	...	...

H.14 Direct Effects (Group number 1 - Default model)

	TECH	PPS	HRC	OC	OP
OC	.606	.752	-.670	.000	.000
OP	.266	.283	-.312	.528	.000
PPS1	.000	1.049	.000	.000	.000
OC3	.000	.000	.000	.809	.000
HRC1	.000	.000	.954	.000	.000
OP7	.000	.000	.000	.000	.798
OP6	.000	.000	.000	.000	.854
OP5	.000	.000	.000	.000	.890
OP4	.000	.000	.000	.000	1.000
OP2	.000	.000	.000	.000	.969
OP1	.000	.000	.000	.000	1.006
OC8	.000	.000	.000	.983	.000
OC7	.000	.000	.000	1.000	.000
OC6	.000	.000	.000	.980	.000
OC5	.000	.000	.000	.793	.000
OC2	.000	.000	.000	.867	.000
OC1	.000	.000	.000	.721	.000
TECH1	1.000	.000	.000	.000	.000
TECH2	.900	.000	.000	.000	.000
TECH3	.540	.000	.000	.000	.000
PPS2	.000	1.000	.000	.000	.000
PPS3	.000	.818	.000	.000	.000
PPS4	.000	1.052	.000	.000	.000
PPS5	.000	.958	.000	.000	.000
HRC2	.000	.000	1.000	.000	.000
HRC3	.000	.000	.874	.000	.000
HRC5	.000	.000	.692	.000	.000

H.15 Direct Effects - Standard Errors (Group number 1 - Default model)

	TECH	PPS	HRC	OC	OP
OC	.103	.160	.120	.000	.000
OP	.112	.142	.116	.104	.000
PPS1	.000	.063	.000	.000	.000
OC3	.000	.000	.000	.068	.000
HRC1	.000	.000	.043	.000	.000
OP7	.000	.000	.000	.000	.068
OP6	.000	.000	.000	.000	.076
OP5	.000	.000	.000	.000	.075
OP4	.000	.000	.000	.000	.000
OP2	.000	.000	.000	.000	.071
OP1	.000	.000	.000	.000	.068
OC8	.000	.000	.000	.057	.000
OC7	.000	.000	.000	.000	.000
OC6	.000	.000	.000	.061	.000
OC5	.000	.000	.000	.067	.000
OC2	.000	.000	.000	.065	.000
OC1	.000	.000	.000	.067	.000
TECH1	.000	.000	.000	.000	.000
TECH2	.059	.000	.000	.000	.000
TECH3	.044	.000	.000	.000	.000
PPS2	.000	.000	.000	.000	.000
PPS3	.000	.058	.000	.000	.000
PPS4	.000	.071	.000	.000	.000
PPS5	.000	.072	.000	.000	.000
HRC2	.000	.000	.000	.000	.000
HRC3	.000	.000	.067	.000	.000
HRC5	.000	.000	.063	.000	.000

H.16 Direct Effects - Lower Bounds (BC) (Group number 1 - Default model)

	TECH	PPS	HRC	OC	OP
OC	.409	.482	-.939	.000	.000
OP	.036	.008	-.555	.332	.000
PPS1	.000	.935	.000	.000	.000
OC3	.000	.000	.000	.675	.000
HRC1	.000	.000	.874	.000	.000
OP7	.000	.000	.000	.000	.668
OP6	.000	.000	.000	.000	.714
OP5	.000	.000	.000	.000	.761
OP4	.000	.000	.000	.000	1.000
OP2	.000	.000	.000	.000	.843
OP1	.000	.000	.000	.000	.888
OC8	.000	.000	.000	.876	.000
OC7	.000	.000	.000	1.000	.000
OC6	.000	.000	.000	.864	.000
OC5	.000	.000	.000	.664	.000
OC2	.000	.000	.000	.743	.000
OC1	.000	.000	.000	.586	.000
TECH1	1.000	.000	.000	.000	.000
TECH2	.791	.000	.000	.000	.000
TECH3	.459	.000	.000	.000	.000
PPS2	.000	1.000	.000	.000	.000
PPS3	.000	.701	.000	.000	.000
PPS4	.000	.927	.000	.000	.000
PPS5	.000	.826	.000	.000	.000
HRC2	.000	.000	1.000	.000	.000
HRC3	.000	.000	.746	.000	.000
HRC5	.000	.000	.571	.000	.000

H.17 Direct Effects - Upper Bounds (BC) (Group number 1 - Default model)

	TECH	PPS	HRC	OC	OP
OC	.821	1.105	-.463	.000	.000
OP	.475	.570	-.094	.745	.000
PPS1	.000	1.183	.000	.000	.000
OC3	.000	.000	.000	.950	.000
HRC1	.000	.000	1.044	.000	.000
OP7	.000	.000	.000	.000	.939
OP6	.000	.000	.000	.000	1.009
OP5	.000	.000	.000	.000	1.057
OP4	.000	.000	.000	.000	1.000
OP2	.000	.000	.000	.000	1.126
OP1	.000	.000	.000	.000	1.158
OC8	.000	.000	.000	1.100	.000
OC7	.000	.000	.000	1.000	.000
OC6	.000	.000	.000	1.104	.000
OC5	.000	.000	.000	.924	.000
OC2	.000	.000	.000	1.001	.000
OC1	.000	.000	.000	.849	.000
TECH1	1.000	.000	.000	.000	.000
TECH2	1.019	.000	.000	.000	.000
TECH3	.629	.000	.000	.000	.000
PPS2	.000	1.000	.000	.000	.000
PPS3	.000	.936	.000	.000	.000
PPS4	.000	1.206	.000	.000	.000
PPS5	.000	1.111	.000	.000	.000
HRC2	.000	.000	1.000	.000	.000
HRC3	.000	.000	1.010	.000	.000
HRC5	.000	.000	.816	.000	.000

H.18 Direct Effects - Two Tailed Significance (BC) (Group number 1 - Default model)

	TECH	PPS	HRC	OC	OP
OC	.000	.000	.000	...	...
OP	.028	.045	.006	.000	...
PPS1	...	.000	...	...	...
OC3	...	...	...	.000	...
HRC1	...	...	.000	...	...
OP7	...	...	...	...	.000
OP6	...	...	...	...	.000
OP5	...	...	...	...	.000
OP4	...	...	...	...	...
OP2	...	...	...	...	.000
OP1	...	...	...	...	.000
OC8	...	...	...	.001	...
OC7	...	...	...	...	...
OC6	...	...	...	.000	...
OC5	...	...	...	.000	...
OC2	...	...	...	.000	...
OC1	...	...	...	.000	...
TECH1	...	...	...	...	...
TECH2	.000	...	...	...	...
TECH3	.000	...	...	...	...
PPS2	...	...	...	...	...
PPS3	...	.000	...	...	...
PPS4	...	.000	...	...	...
PPS5	...	.000	...	...	...
HRC2	...	...	...	...	...
HRC3	...	...	.000	...	...
HRC5	...	...	.000	...	...

H.19 Indirect Effects (Group number 1 - Default model)

	TECH	PPS	HRC	OC	OP
OC	.000	.000	.000	.000	.000
OP	.320	.397	-.354	.000	.000
PPS1	.000	.000	.000	.000	.000
OC3	.490	.608	-.542	.000	.000
HRC1	.000	.000	.000	.000	.000
OP7	.468	.543	-.531	.421	.000
OP6	.501	.582	-.569	.451	.000
OP5	.522	.606	-.592	.470	.000
OP4	.586	.681	-.666	.528	.000
OP2	.568	.660	-.645	.512	.000
OP1	.590	.685	-.670	.532	.000
OC8	.596	.740	-.659	.000	.000
OC7	.606	.752	-.670	.000	.000
OC6	.594	.737	-.656	.000	.000
OC5	.481	.597	-.531	.000	.000
OC2	.526	.652	-.581	.000	.000
OC1	.437	.543	-.483	.000	.000
TECH1	.000	.000	.000	.000	.000
TECH2	.000	.000	.000	.000	.000
TECH3	.000	.000	.000	.000	.000
PPS2	.000	.000	.000	.000	.000
PPS3	.000	.000	.000	.000	.000
PPS4	.000	.000	.000	.000	.000
PPS5	.000	.000	.000	.000	.000
HRC2	.000	.000	.000	.000	.000
HRC3	.000	.000	.000	.000	.000
HRC5	.000	.000	.000	.000	.000

H.20 Indirect Effects - Standard Errors (Group number 1 - Default model)

	TECH	PPS	HRC	OC	OP
OC	.000	.000	.000	.000	.000
OP	.082	.112	.093	.000	.000
PPS1	.000	.000	.000	.000	.000
OC3	.090	.136	.107	.000	.000
HRC1	.000	.000	.000	.000	.000
OP7	.088	.124	.097	.085	.000
OP6	.092	.130	.098	.088	.000
OP5	.094	.138	.110	.087	.000
OP4	.103	.147	.123	.104	.000
OP2	.100	.150	.120	.095	.000
OP1	.102	.153	.120	.098	.000
OC8	.097	.157	.118	.000	.000
OC7	.103	.160	.120	.000	.000
OC6	.097	.165	.124	.000	.000
OC5	.085	.137	.108	.000	.000
OC2	.086	.146	.109	.000	.000
OC1	.078	.121	.088	.000	.000
TECH1	.000	.000	.000	.000	.000
TECH2	.000	.000	.000	.000	.000
TECH3	.000	.000	.000	.000	.000
PPS2	.000	.000	.000	.000	.000
PPS3	.000	.000	.000	.000	.000
PPS4	.000	.000	.000	.000	.000
PPS5	.000	.000	.000	.000	.000
HRC2	.000	.000	.000	.000	.000
HRC3	.000	.000	.000	.000	.000
HRC5	.000	.000	.000	.000	.000

H.21 Indirect Effects - Lower Bounds (BC) (Group number 1 - Default model)

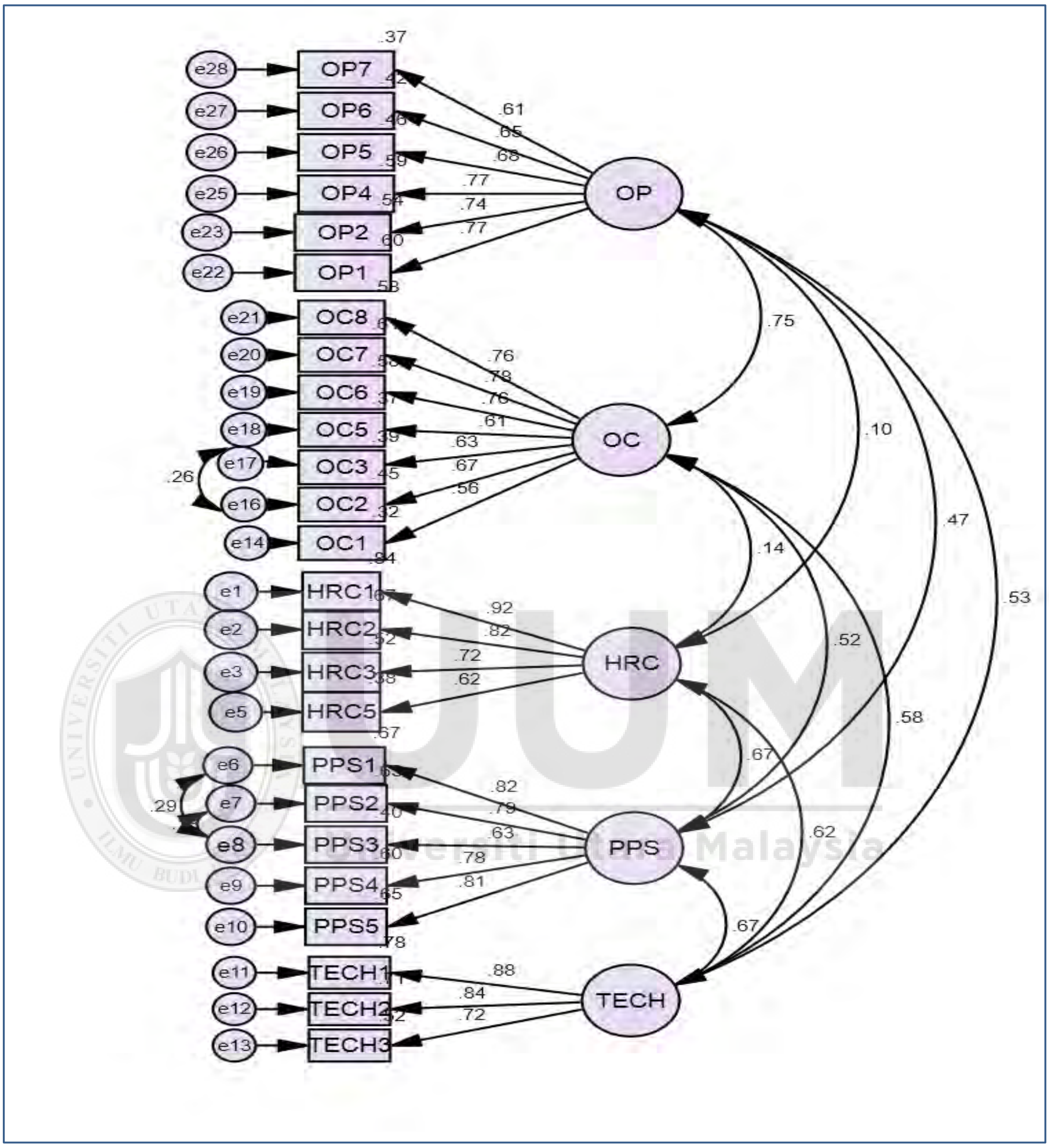
	TECH	PPS	HRC	OC	OP
OC	.000	.000	.000	.000	.000
OP	.186	.226	-.577	.000	.000
PPS1	.000	.000	.000	.000	.000
OC3	.324	.388	-.779	.000	.000
HRC1	.000	.000	.000	.000	.000
OP7	.289	.331	-.743	.266	.000
OP6	.316	.358	-.780	.289	.000
OP5	.331	.371	-.832	.307	.000
OP4	.369	.427	-.920	.332	.000
OP2	.368	.410	-.911	.337	.000
OP1	.379	.424	-.924	.347	.000
OC8	.403	.468	-.907	.000	.000
OC7	.409	.482	-.939	.000	.000
OC6	.408	.464	-.931	.000	.000
OC5	.324	.374	-.765	.000	.000
OC2	.360	.410	-.821	.000	.000
OC1	.290	.346	-.684	.000	.000
TECH1	.000	.000	.000	.000	.000
TECH2	.000	.000	.000	.000	.000
TECH3	.000	.000	.000	.000	.000
PPS2	.000	.000	.000	.000	.000
PPS3	.000	.000	.000	.000	.000
PPS4	.000	.000	.000	.000	.000
PPS5	.000	.000	.000	.000	.000
HRC2	.000	.000	.000	.000	.000
HRC3	.000	.000	.000	.000	.000
HRC5	.000	.000	.000	.000	.000

H.22 Indirect Effects - Upper Bounds (BC) (Group number 1 - Default model)

	TECH	PPS	HRC	OC	OP
OC	.000	.000	.000	.000	.000
OP	.516	.678	-.208	.000	.000
PPS1	.000	.000	.000	.000	.000
OC3	.676	.918	-.361	.000	.000
HRC1	.000	.000	.000	.000	.000
OP7	.640	.815	-.363	.601	.000
OP6	.680	.869	-.394	.633	.000
OP5	.707	.914	-.398	.651	.000
OP4	.781	1.003	-.444	.745	.000
OP2	.763	.995	-.436	.710	.000
OP1	.785	1.017	-.453	.733	.000
OC8	.788	1.081	-.450	.000	.000
OC7	.821	1.105	-.463	.000	.000
OC6	.789	1.103	-.442	.000	.000
OC5	.663	.903	-.342	.000	.000
OC2	.704	.984	-.396	.000	.000
OC1	.599	.811	-.335	.000	.000
TECH1	.000	.000	.000	.000	.000
TECH2	.000	.000	.000	.000	.000
TECH3	.000	.000	.000	.000	.000
PPS2	.000	.000	.000	.000	.000
PPS3	.000	.000	.000	.000	.000
PPS4	.000	.000	.000	.000	.000
PPS5	.000	.000	.000	.000	.000
HRC2	.000	.000	.000	.000	.000
HRC3	.000	.000	.000	.000	.000
HRC5	.000	.000	.000	.000	.000

H.23 Indirect Effects - Two Tailed Significance (BC) (Group number 1 - Default model)

	TECH	PPS	HRC	OC	OP
OC	...	...	...	...	...
OP	.000	.000	.000	...	...
PPS1	...	...	...	...	...
OC3	.000	.000	.000	...	...
HRC1	...	...	...	...	...
OP7	.000	.000	.000	.000	...
OP6	.000	.000	.000	.000	...
OP5	.000	.000	.000	.000	...
OP4	.000	.000	.000	.000	...
OP2	.000	.000	.000	.000	...
OP1	.000	.000	.000	.000	...
OC8	.000	.001	.000	...	...
OC7	.000	.000	.000	...	...
OC6	.000	.000	.000	...	...
OC5	.000	.000	.000	...	...
OC2	.000	.000	.000	...	...
OC1	.000	.000	.000	...	...
TECH1	...	...	...	...	...
TECH2	...	...	...	...	...
TECH3	...	...	...	...	...
PPS2	...	...	...	...	...
PPS3	...	...	...	...	...
PPS4	...	...	...	...	...
PPS5	...	...	...	...	...
HRC2	...	...	...	...	...
HRC3	...	...	...	...	...
HRC5	...	...	...	...	...



e28
e27
e26
e25
e23
e22
OP7
OP6
OP5
OP4
OP2
OP1
.37
.42
.61
.65
.68
.77
.74
.77
.59
.54
.60
OP
.75
e21
e20
e19
e18
e17
e16
e14
OC8
OC7
OC6
OC5
OC3
OC2
OC1
.76
.78
.76
.61
.63
.67
.56
.26
.39
.45
.32
OC
.10
.47
.14
.84
e1
e2
e3
e5
HRC1
HRC2
HRC3
HRC5
.92
.82
.72
.62
HRC
.53
.52
.58
.67
e6
e7
e8
e9
e10
PPS1
PPS2
PPS3
PPS4
PPS5
.29
.82
.79
.63
.78
.81
.40
.60
.65
PPS
.62
.67
.78
e11
e12
e13
TECH1
TECH2
TECH3
.88
.84
.72
TECH

H.24 Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
HRC5	<---	HRC	.618
HRC3	<---	HRC	.719
HRC2	<---	HRC	.818
PPS5	<---	PPS	.808
PPS4	<---	PPS	.776
PPS3	<---	PPS	.633
PPS2	<---	PPS	.791
TECH3	<---	TECH	.723
TECH2	<---	TECH	.840
TECH1	<---	TECH	.883
OC1	<---	OC	.562
OC2	<---	OC	.672
OC5	<---	OC	.611
OC6	<---	OC	.764
OC7	<---	OC	.778
OC8	<---	OC	.762
OP1	<---	OP	.772
OP2	<---	OP	.737
OP4	<---	OP	.766
OP5	<---	OP	.675
OP6	<---	OP	.647
OP7	<---	OP	.605
HRC1	<---	HRC	.918
OC3	<---	OC	.628
PPS1	<---	PPS	.816

H.25 Correlations: (Group number 1 - Default model)

			Estimate
HRC	<-->	PPS	.671
HRC	<-->	TECH	.615
HRC	<-->	OC	.143
HRC	<-->	OP	.105
PPS	<-->	TECH	.671
PPS	<-->	OC	.518
PPS	<-->	OP	.468
TECH	<-->	OC	.575
TECH	<-->	OP	.535
OC	<-->	OP	.746
e8	<-->	e6	.294
e8	<-->	e7	.181
e16	<-->	e17	.256

H.26 Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
PPS1	.666
OC3	.394
HRC1	.844
OP7	.366
OP6	.419
OP5	.456
OP4	.587
OP2	.543
OP1	.595
OC8	.581
OC7	.605
OC6	.583
OC5	.373
OC2	.452
OC1	.315
TECH1	.780
TECH2	.705
TECH3	.523
PPS2	.625
PPS3	.401
PPS4	.602
PPS5	.653
HRC2	.670
HRC3	.517
HRC5	.382

H.27 CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	63	691.766	262	.000	2.640
Saturated model	325	.000	0		
Independence model	25	5280.921	300	.000	17.603

H.28a Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.869	.850	.914	.901	.914
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

H.28b Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.869	.850	.914	.901	.914
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

H.29 RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.068	.061	.074	.000
Independence model	.215	.210	.220	.000

Appendix I: Table Sample Size (Krejcie & morgan)

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

Appendix J: Curriculum Vitae

NAME

A. HARITS NU'MAN

BIRTH

Bandung, April 21th 1969

RELIGION

Moslem

STATUS

Married

Wife : Yayan Ruhyani, S. Sos
Child : Muhammad Syauqi Alharits (Male)
Rhianna Alisha Alharits (Female)
Anissa Shakeyra Alharits (Female)

EDUCATION

▪ (Elementary School) SD Negeri 4 Dayeuhkolot Bandung	1976 – 1982
▪ (Junior High School) SLTPN 1 Dayeuhkolot Bandung	
▪ (High School) SMUN Pematang Siantar Sumatra Utara	1982 – 1985
▪ (Bachelor Degree) S1 Universiti Islam Bandung, Industrial	1985 – 1988
Engineering and Management, Bandung	1988 – 1993
▪ (Masters Degree) S2 ITB Industrial Engineering and	
Management, Bandung	2001 – 2003
▪ Ph.D Schoolof Technology Management and Logistic	
Universiti Utara Malaysia	2010 – now

AWARDS RECEIVED/ACHIEVEMENT

Academic

- Best Lab. Assistant In Industrial Engineering and Management, Universitas Islam Bandung,
- Cumlaude in Masters Degree S2 ITB Industrial Engineering and Management, ITB Bandung
- Block Grant Technopreneurship Laboratory in Industrial Engineering Departement Universitas Islam Bandung, Directorat General Higher Education 2006
- Block Grant for Health Proffesional Education of Quality (HPEQ) in Medical Education Departement Universitas Islam Bandung, Directorat General Higher Education 2011 – 2014.

Non Academic

- Champion of Speech Competition in Junior High School, 1982
- Champion of Football League in High School as goalkeeper, 1986
- Man of the Macth of Football League in High School as goalkeeper, 1987
- Man of the Macth of Football League in Unisba Championship as goalkeeper, 2000 – 2001
- Best Performance of Football League in Unisba Championship as goalkeeper, 2001 –

2002

- Champion Mixed Dobble Badminton in Unisba Championship, 2003
- Best Lecturer in Technique Faculty Industrial Engineering and Management, Universitas Islam Bandung, 2006
- Best Lecturer in Technique Faculty Industrial Engineering and Management, Universitas Islam Bandung (UNISBA), 2007

HOBBIES-INTERESTS & ACTIVITIES

- Read, Football (Soccer & Futsal)
- Watch movie (Cinema or DVD), Listen to Music
- Sport, Fitness,

EXTRACURRICULAR ACTIVITIES

- Kushin Ryu Karate Do Indonesia (Black belt – II). 1994
- Majelis Percikan Iman
- Majelis Daarut Tauhid
- Futsal team Lecturers & Staff Technique faculty of UNISBA (Coordinator)

WORKING EXPERIENCE

- Tutor (lecturer) in Mahagoni Hasta Purnama Consultant, 1993 – 1995
- Consultant Industrial Engineering and Management in Kogas Dryap Consultant, 1995 – 1998
- Consultant Industrial Engineering and Management in PT Mitra Kawasa Konsultindo 1999 – present
- Consultant Industrial Engineering and Management in Public Works Service Pusat Penelitian Jalan dan Jembatan 2011 – 2013
- Consultant Industrial Engineering and Management in KOPISMA, 2008 – present
- Lecturer of Industrial Engineering and Management STT Garut. 1996 – 2000
- Lecturer of UNISBA Technique Faculty Industrial Engineering and Management. 1999 – present
- Head of Department Industrial Engineering and Management. 2004 – 2007
- Executive Secretary of Badan Penjaminan Mutu (Quality Assurance) UNISBA, 2008 - 2011
- Head of Block Grant Program Hibah Kompetisi berbasis Istitusi in Universitas Islam Bandung, Directorat General Higher Education 2008 - 2011
- Executive Secretary of Health Professional Education Quality UNISBA, 2011 – 2014
- Education and Management Quality Improvement Consultant 2007 – present.