



## **Integrate Reengineering and TQM: An Attempt to Redefine Reformation**

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*This study examines the structural relationships between TQM, Reengineering, Operational Excellence in downstream and upstream sectors, Reformation, and sustainable community development program. A good understanding of how oil and gas industry should integrate mainstreaming the approach to sustainable community development into policymaking. Sustainable community development should be implemented by considering the links between change management through TQM and reengineering, operational excellence applications, and the real reformation. Recognizing that contributions of reformation (via the amendment of law of the Republic of Indonesia No. 22/2001 concerning oil and natural gas) in the sustainable community development is a key component in the Indonesia's economy reform and recovery.*

*Empirical evidences find that seven causal paths specified in the hypothesized model were found to be positive and statistically significant. Furthermore empirical results suggest that reengineering has a positive and significant indirect effect on sustainable community development program through its direct effect on operational excellence in supply chain; and reformation. The result also shows that a complete model fit and the acceptable parameter level which indicate the overall parameter are good fit between the hypothesized model and the observed data. By concentrating on a single industry (oil and gas) is that SEM specification of the structural relationship model between six constructs can be more complete and specific because unique characteristics of the oil and gas industry can be included (upstream and downstream chain activities). Finally, the particular design of the research and the findings suggest that the structural model of the study has a great potential for replication to business as well as public sectors.*

**Keywords:** *Operational Excellence, Reengineering, Reformation, Total Quality Management (TQM), and Sustainable Community Development Program.*

## Introduction

In the relatively brief eight years since the end of the Soeharto presidency on May 21, 1998, four Presidents (B.J. Habibie, A.R. Wahid, Megawati Soekarnoputri, and Susilo Bambang Yudhoyono) with markedly different styles and priorities have held the leadership of the Indonesian state. The experience gained during these four periods of presidency, of course, greatly enriched the institution of the office of the President in Indonesia, but it is still rather early to be able to evaluate the position of the institution of the presidency in Indonesia in the post—Soeharto period (Basri and Eng, 2004).

Nine years after the Reformation era came to power (1998–2007), the reformation spirit embodied in Indonesian organizations began to fade away. The headlines of Indonesian newspapers continue to report many disappointing examples of Indonesian management practices, particularly as regards solving the current multi dimensional crisis (the grey area of reformation). These include extra ordinary crime such as multi—level corruption, collusion, manipulation; illegal logging; illegal fishing, inequalities in income distribution; unemployment; vacuum wise leadership, and demoralization facts; and many incidences of mismanagement (promote the bad and prevent the good). All of these issues force us to question ourselves: “Why are those things happening” and “What is the solution?” My concern with these issues underlies my belief that, in order to survive successfully in the reformation era, Indonesian organizations will need to be re—adjusted towards the real reformation (not just the rhetoric reformation).

The period of 2004 – 2009 is important transition years for entering the era of New Indonesia—the real reformation era, following efforts of managing with the triple—A strategy (Agility, Adaptability, Alignment; Lee, 2004) in facing up to global challenges. Triple—A strategy is an important

requirement for organizations and nations to stay ahead competition and survive in the global competitive market place. *Agility* has been defined in the literature as the ability to thrive and prosper in a competitive environment and to respond quickly to rapidly changing markets and customer/society needs (Flidner and Vokurka, 1997) ; (Lee, 2004). Goldman et al., 1995 in Flidner and Vokurka (1997) identified for key dimensions of agile competition: enriching the customer or the society; cooperating to enhance the organization/nation competitiveness; organizing the master change and uncertainty through quality and innovation; and leveraging the impact of people, information, and technology. These dimensions recognize the importance of employees/citizens as a company/nation asset and therefore place greater emphasis on the development of this asset through education, training and empowerment. *Adaptability* is the ability to adapt over time as market structures and change strategies evolve (Lee, 2004). *Alignment* is the ability to align the interests of all firms (nations) in the supply—demand network (Lee, 2004). Triple—A merges the four distinctive competencies of flexibility, dependability, quality, and cost (Flidner and Vokurka, 1997; Lee, 2004).

Good managers create value (value creation) throughout the value chain of the company—upstream (supply—chains), midstream or mainstream chains (value—added processes), and downstream chains (demand—chains; Kinicki and Wiiliams, 2006). The reason is that in being a manager he or she has a multiplier effect. His/her influence on the organization is multiplied far beyond the results that can be achieved by just one person acting alone. Lee (2004) stated that the best value chains are not just fast and cost—effective. They are also agile and adaptable, and they ensure all their companies’ interests stay aligned. The implementation of Triple—A strategy requires the interaction between quality improvement

(TQM) and quantum leap of innovation or reengineering (Lee, 2004; Rossetto and Franceschini, 1995; Rice and Mahmoud, 2001). In the present study, I try to understand the interaction between reengineering and TQM which exist throughout the oil and gas chains.

In recent times, most people have viewed sustainable economic development as the most important way to reduce poverty, unemployment, and raise living standards (non financial performance). This has led nations (especially for developing countries) to pursue economic growth through the nation competitiveness, and has resulted in impressive economic gains worldwide (World Bank Institute, 2000). However, more than a billion people around the world still live in acute poverty, and the earth's population is likely to double in the next 40 years. This implies that far more economic development and environmental sustainability will be required to achieve acceptable minimal standards of living for everyone (the quality of life).

In the Indonesia context, two points are vital. *First*, the Government of Indonesia (GOI) should pursue development while at the same time attempting to eliminate differences between the rich and the poor and also to accelerate the development of entrepreneurship in small and medium—sized enterprises (SMEs). In other words, distribution of wealth must remain the top priority. *Second*, economic development and disasters management must be achieved in an environmentally sustainable manner—sustainability of community development. To achieve these critical factors, all parties and stakeholders will have to make continuous efforts, and collaboration between governments, civil society, nongovernmental organizations, private industry, and other institutions is essential. The responsibility of the Government of Indonesia (GOI) in terms of the implementation of Triple—A strategy is to develop its nation competitiveness. The nation competitiveness is the degree to which a nation can produce goods and services that

meet the need of global markets (export oriented policies) while simultaneously maintaining or expanding the real income of its citizen (Grubel and Lloyd, 1975 in Cleff, 2006). The nation competitiveness can be measured as productivity or economic (the surplus of export—import) growth. Only through productivity the nation can improve the standard of living (quality of life). In addition, productivity begins and ends with the society (Heizer and Render, 2006). Due to increased competitive and environmental pressure, today's oil and gas and local government managers are continually looking for ways to improve and sustain their non financial performance through sustainable community development program (Oil and Gas Magazine, 2003). Implementing sustainable community development is expected to enhance company financial performance.

For some time now, sustainable community development program has become a must. In addition, the Indonesia's oil and gas industry is aiming to develop and maintain harmonious relationship with its surrounding community wherever it operates and to work hand in hand with the local government in order to provide the greatest benefits to the communities. The oil and gas companies are committed to be responsible for their community development, corporate social responsibility and environmental obligations by continuously conforming to the principles of sustainable community development program.

Sustainable community development program is realization of oil and gas companies' responsibilities towards the growth and development of the surrounding community as company non financial performance. The oil and gas companies' community development includes various initiatives including economic efficiency, social equity and participation and environmental system. The essential connections between economic, social and environmental have gained universal

acceptance. Current researches must focus on collecting and integrating information to reflect the goals of sustainable community development.

A primary motive of this study was to encourage future researchers to more deeply investigate the structural relationships between TQM (continuous process improvement based on Deming's principle), Reengineering (the quantum leap of innovation of order and law, code of conduct, rule of the game, and policy consistency), the contextual factors of oil and gas companies—operational excellence practices in downstream and upstream sectors, reformation practices (the Amendment of Law of the Republic of Indonesia Concerning Oil and Natural Gas No.22/2001), and sustainable community development program (based on seven principles of approach to sustainable community development). Hopefully by investigating these structural relationships, researchers will be able to advance knowledge and understanding in the appropriate definition of reformation.

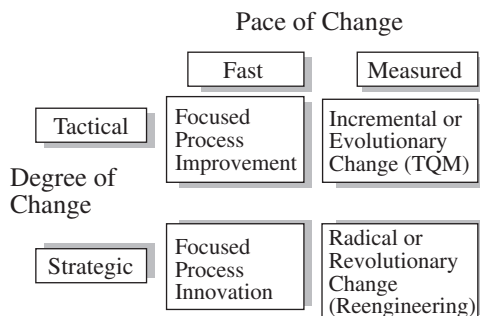
The rest of this paper is organized as follows. The next sections of this study discuss the integration between evolutionary and revolutionary changes and the observations from the integration between TQM and Reengineering to pursue the successful reformation strategy. The conclusions and contributions are provided at the last session.

## The Integration Between Evolutionary Change (TQM) and Revolutionary Change (Reengineering)

Based on the lessons from successful and unsuccessful TQM and Reengineering implementations that have already done by worldwide organizations in the past two decades (1987-2007), attempts are needed to realize that TQM and Reengineering practices need not to operate in isolation from other change initiative programs, it could be

integrated. Both evolutionary change (TQM) and revolutionary change (Reengineering) involve processes as the primary unit of analysis, and rigorous measurement of process performance is necessary for either to succeed. Both process improvement and innovation also require significant organizational and behavioral change to be successful. Both TQM and reengineering programs require a substantial investment of time, often as much as one or two years before significant results can be seen. TQM requires time—consuming training and cultural change, while Reengineering typically requires time for construction of new information systems and organizational structures (Davenport, 1993). Davenport (1993), Rice and Mahmoud (2001), Sohmen (1998) argued that failing to integrate these change strategies (TQM and reengineering) can be quite demoralizing for those who participate in process changes. Deming and Juran who founded the quality movement, advocated gradual improvement and breakthroughs in process as part of the quality program (Davenport, 1993). Figure 1 and Table 1 show the differences between reengineering and TQM. Successful the integration between TQM and Reengineering in the Indonesia's context requires recognizing the sequential model of TQM—Reengineering strategy—company non financial performance (sustainable community development) links. The next section describes the sequential model of the study.

Figure 1. TQM vs Reengineering



Source: Davenport (1993, 8)

Table 1. Alternative Change Management

Element	Incremental or Evolutionary Change (TQM)	Radical or Revolutionary Change (Reengineering)
<b>1. Leadership</b>	Insiders	Outsiders
<b>2. Outside resources</b>	Few, if any, consultants	Consultant led initiative
<b>3. Physical separation</b>	No, part-time team members	Yes, Greenfield site
<b>4. Financial crisis</b>	None	Poor performance
<b>5. Rigid milestones</b>	Flexible milestone	Firm milestones
<b>6. New reward/compensation</b>	No change	New scheme
<b>7. Simultaneous IT/process change</b>	Process first	Simultaneous process and IT

Source: Jarvenpaa & Stoddard (1998)

## A Sequential Model of TQM—Reengineering Strategy—Sustainable Community Development Links

Researchers like Ettlie (1983); Ettlie, Bridges, and O’Keefe (1984); and Kamm (1987) suggest two possible approaches of the associations’ model between the dimensions of a company’s innovation (reengineering) /improvement TQM strategy and company performance (Zahra and Das, 1993). In the first, innovation/improvement strategy dimensions are assumed to influence company performance directly and simultaneously (a simultaneous model of innovation/improvement strategy—company performance links). The second approach suggests a logical sequence among innovation/improvement strategy variables and its contextual factors (a sequential model of innovation/improvement strategy—company performance links). Hence, the associations between certain innovation/improvement strategy dimensions and company performance may be indirect; that is, the effect of one dimension may be mediated by the influence of other dimensions (contextual factors).

This study posits a logical sequence of

TQM/reengineering strategy may exist among the Deming’s principle (Deming’s 14 points), and 4 dimensions of quantum leap innovation (order and law, code of conduct, rule of the game, policy consistency); and reflecting an ordered set of TQM practices and reengineering practices (as independent variables), the contextual factors of oil and gas companies—operational excellence practices in downstream sector, operational excellence in upstream sector, reformation practices—as mediating variables, company non financial performance (sustainable community development as a dependent variable). Certain choices (e.g., reengineering and TQM strategies) must precede others (e.g., operational excellence practices in upstream and downstream sectors—as mediating variables). The sequential model also acknowledges the potential indirect influence of reengineering or TQM on company non—financial performance. Even though a variable may not influence non—financial performance directly, it may still influence other important dimensions that, in turn, affect company non—financial performance (sustainable community development). Unfortunately, a clear comprehensive framework presently does not exist to show the structural relationships among TQM—Reengineering, contextual factors (operational excellence practices in

supply—chain and demand—chain), reformation, and company performance. This comprehensiveness relationship is generally lacking in the literature. Most past studies have focused primarily on the association between specific dimensions of critical factors of TQM or quantum leap innovation (reengineering) and company performance (Demirbag et al., 2006; Feng et al., 2006; Kaynak, 2003).

The theoretical model developed here is based on six research constructs. The six constructs found in Figure 3 are discussed in the following section.

Change Management—TQM and Reengineering—offers coherent and proven approach to overcoming such resistance and searching for competitive advantage (Nadler, 1998). Today's demanding business and public sector places strong emphasize on dynamic change management. The purpose of change management is to help leaders, managers, and entrepreneurs learn how to change (evolutionary or revolutionary) not only an organization's strategy, structure, and operations, but also perceptions, expectations, and performance of the organization. These efforts were achieved through TQM and reengineering (Hammer and Champy, 1993; and Champy, 1995). The combination of TQM (continuous process improvement based on Deming's 14 points) and reengineering (the quantum leap of order and law, code of conduct, rule of the game, and policy consistency) are being redefined to meet four competitive priorities (agility)—flexibility, dependability, quality, and cost. (Fliedner and Vokurka, 1997; Ohtaki, 2005). The fourteen points of Deming's principles are:

1. Create constancy of purpose to improve product and service.
2. Adopt a new philosophy for the new economic age with management learning what their responsibilities are, and by assuming leadership for change.
3. Cease dependence on inspection to

achieve quality by building quality into the product.

4. End awarding business on price. Award business on total cost and move toward single suppliers.
5. Aim for continuous improve productivity and quality, and to decrease costs.
6. Institute training on the job.
7. Institute leadership with the aim of supervising people to help them to do a better job.
8. Drive out fear so that everyone can work effectively together for the organizations.
9. Break down barriers between departments. Encourage research, design, sales, and production (four main organizational functions) to work together to foresee difficulties in production and use.
10. Eliminate slogans, exhortations and numerical targets for the workforce since they are advisory, and anyway difficulties belong to the whole system.
11. (a) Eliminate numerical quotas for production. Instead, learn and institute methods for improvement.  
(b) Eliminate MBO (Management By Objective). Instead, learn the capabilities of processes and how to improve them.
12. Remove barriers that rob people of their right to pride in their work.
13. Institute a vigorous education and self—improvement program.
14. Put everyone in the company to work to accomplish the transformation (ByeongGone, 1997).

In addition, TQM (adaptive strategy) can be defined as:

A holistic management philosophy aiming at continuous improvement in all functions of an organization to produce and deliver commodities or services in line with customers' needs or requirements by better, cheaper, faster, safer, easier processing than competitors with the participation of all employees the

leadership of top, middle, and low levels of management—as the objectives of improvement strategy (Demirbag et al., 2006).

The role of TQM is widely recognized as being critical determinant in the success and survival of both manufacturing and service organizations in today's competitive environment (Demirbag et al., 2006). TQM is also seen as a source of competitive advantage (Douglas and Judge, 2001; Hackman and Wageman, 1995; Powel, 1995), innovation (Sing and Smith, 2004), change and new organizational culture (Irani et al., 2004). Any decline in customer satisfaction due to poor product/service quality would be a serious cause of organizational failure. Customers are becoming increasingly aware of rising standards in product/service quality, prompted by competitive trends, which have developed higher expectations (Demirbag et al., 2006).

The classic definition of reengineering is given Hammer and Champy (1993), who formally introduced the concept:

Reengineering (intended strategy) is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements (innovations) in critical, contemporary measures of performance, such as cost, quality, service, and speed.

Reengineering is effective use of the principles of change management. The definition applies to—organization—wide goals of radically streamlining business processes.

Operational Excellence Practices. In the pursuit of global competitive advantage, it is increasingly important to execute the organizations' vision and mission by focusing on operational excellence consistently (Allen and Kutnick, 2002; U.S. NAVAIR, 2002). Operational excellence reflects the organization's adoption and regular process

for assuring essential global management system standards by implementing all aspects of organizational development (Mandell, 1999). To implement operational excellence requires total quality management (TQM) and reengineering practices (Parker, 1999). According to Parker, operational excellence is superior to TQM and reengineering because it changes work processes fundamentally. Operational excellence is management philosophy that demands introspection action, and a focus on continuous process improvement and quantum leap innovation (TQM and Reengineering).

Parker (1999) defined operational excellence is the systematic management of safety, environment, health, reliability, and efficiency (SEHRE) while simultaneously implementing corporate social responsibility (CSR) to achieve world—class organization.

Operational Excellence practices in Demand—Chain (Downstream Sector) was operationalized using four dimensions of corporate social responsibility (CSR). The measure was developed by Carol & Buchholtz (2003). CSR encompasses the economic, legal, ethical and discretionary (philanthropic) expectations that society has of organizations at a given point in time (Kotler & Lee, 2005). In addition, CSR in equation form is the sum of economic responsibilities (make a profit), legal responsibilities (obey the law), ethical responsibilities (be ethical), and philanthropic responsibilities (good corporate citizen). The term operational excellence in demand chain was used because these firms (Strategic Business Units or SBUs) were associated with outstanding operational reliability performance in the global oil and gas market.

Operational Excellence practices in Supply—Chain (Upstream Sector) was operationalized using five dimensions of SEHRE (Safety, Environmental, Health, Reliability, Efficiency). The measure was adapted from ChevronTexaco 2003. To succeed the ChevronTexaco must achieve world—class performance and exceed the

capability of the strongest competitor. To do so, the management of the ChevronTexaco company develops the five dimensions of operational excellence in supply chain: achieve an injury—free work place (Safety), eliminate spills and environmental incidents and identity, mitigate key environmental risks (Environmental), promote a healthy work place and mitigate significant health risks (Health), operate incident—free with industry leading asset availability (Reliability), and maximize utilization of resources/asset (Efficiency) in order to improve the productivity performance (Indonesia Business Unit, 2002).

Reformation is an improvement effort (or an intended improvement) in the existing form or condition of institutions or practices; intended to make a striking change for the better in social or political or religious affairs (<http://www.google.com>, 2005). Based on Maslow's Hierarchy needs, the motivation of reformation is an effort to fulfill human needs according to the lowest to the highest ranks (Koontz et al., 1986). In addition, the need for self—actualization should be the first priority for the real reformation program (upturning the Maslow's hierarchy needs). It is the desire to become what one is capable of becoming—to implement the fair and free reward (recognition) and punishment (law enforcement) system in order to establish the real commitment (sense of belonging) of the organizational members or the society (Higginson and Waxler, 1994).

The oil and gas policy reform (the amendment of law concerning oil and gas no. 22/2001) is necessary in order to maintain Indonesia's status as a net oil exporter and enhance efficient use of energy resources. To do so, the government must implement legislation and policies that will attract new private direct investment and rationalize use of Indonesia's energy resources and support the Indonesia's reformation program successfully (Embassy of USA, 2004). The period of 2001 – 2006 is important transition

years for Indonesia's Oil and Gas Industry, following passage of a new oil and gas law in October 2001. The Indonesian Parliament passed the oil law on October 23, 2001 (Law 22/2001). This new Law, which replaced the 1960 Oil and Gas Law and Law for State Owned Company 8/1971, required the upstream and downstream sectors to deregulate within five years (2001-2006). The amendment of law created two new governmental bodies: the Executive Body that takes over State Owned Company's upstream functions and the Regulatory Body that supervises downstream operations (The Government of Republic of Indonesia, 2001).

The Executive Body (Oil and Gas Upstream Implementing Body) or BPMIGAS was established on July 16, 2002 (Government Regulation No. 42/2002). It took over State Owned Company's upstream regulatory functions and management of oil and gas contractors. The Regulatory Body (Oil and Gas Downstream Regulatory Body) or BPH MIGAS was established on December 30, 2002 (Government Regulation No. 67/2002). It has license downstream operators to assure sufficient natural gas and domestic fuel supplies and the safe operation of refining, storing, transport and distribution of petroleum products.

Sustainable Community Development Program is realization of oil and gas companies' responsibilities towards the growth and development of the surrounding community. The oil and gas companies' community development includes various initiatives including economic efficiency, social equity and participation and environmental system. The essential connections between economic, social and environmental have gained universal acceptance. Current researches must focus on collecting and integrating information to reflect the goals of sustainable community development.

According to Sekiyu (2004) and McDermott (2000) there are seven approaches

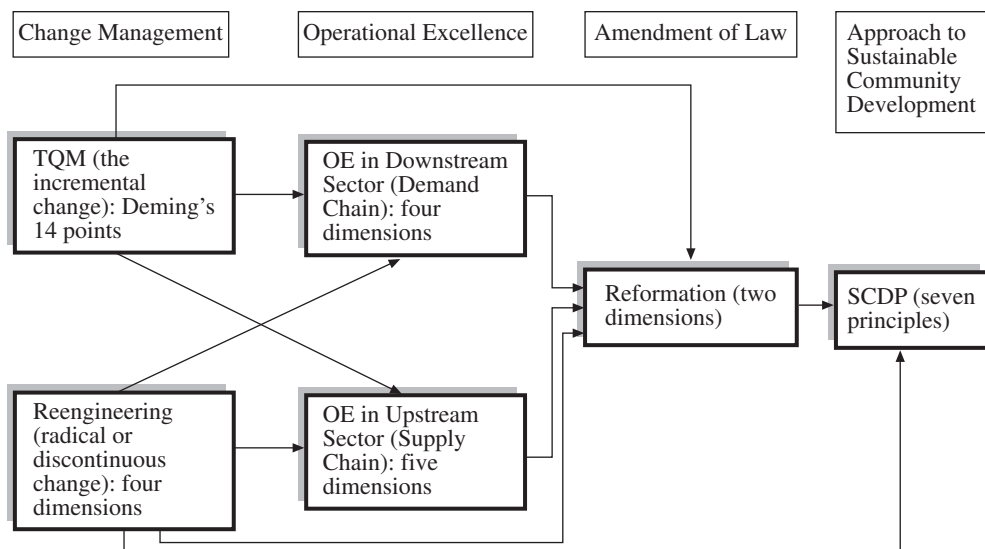
to sustainable community development program: commitment to a solid earnings foundation, provision of value to customer (economic perspective), environmental protection, resource management (environmental perspective), respect and protection for all, contributions to society (social perspective), and collaboration with stakeholders (stakeholders perspective). Figure 2 depicts the theoretical model of the study. The model is developed based on findings and conceptualizations of the compilation from previews studies—Cokins, 2004; Demirbag et al., 2006; Kaynak, 2003; Samson and Terziovski, 1999).

There is a relatively large body of empirical studies that measure company (business) performance by continuous improvement or TQM and radical process innovation (Reengineering) criteria (Samson and Terziovski, 1999; Flynn et al., 1994; Wilson and Collier, 2000; Fynes and Voss, 2001; Flynn and Saladin, 2001; Montes et al., 2003; Banson et al., 1991; Choi and Eboch, 1998). These studies explore a variety of theoretical (conceptual) and empirical

(contextual) issues. If TQM or reengineering (process innovation) plan is implemented properly, it produces impact on a wide range of areas including understanding customers'/society's needs, improved customer/society satisfaction, improved internal communication, better problem solving and fewer errors (Demirbag et al., 2006). The combination among these process improvement and process innovation eventually leads to increased sales, market penetration, and higher profits and returns (Cokins, 2004).

Although financial performance is generally accepted as the ultimate aim of business organizations, in the case of oil and gas companies, non financial performance indicators are also equally important in implementing TQM and reengineering principles. TQM and reengineering practices may not only affect financial performance directly (Kaynak, 2003), but also in some indirect ways such as increasing non financial performance (Sing and Smith, 2004), changing organizational culture (Irani et al., 2004), market competitiveness (Chong and Rundus,

Figure 2. Theoretical Model



2004), overall organizational performance (Powel, 1995), market—share and market—share growth (Kaynak, 2003), employee morale (Rahman and Bullock, 2005), productivity (Rahman and Bullock, 2005; Kaynak, 2003; Rahman, 2001). Prajogo and Sohal (2001) report two main arguments on the relationship between TQM and innovation (reengineering) where the first argument suggests that TQM be positively related to increasing innovation capacity of TQM practicing firms. The second argument, however, focuses on the negative relationship between TQM implementation and innovative performance of firms. The logic behind this argument is that customer focus and its principles may trap organizations into captive markets where they focus only on existing customers, which may result in ignoring the search for innovation and novel solutions (Prajogo and Sohal, 2006). Samson and Terziovski (1999) found support for the relationship between some non—financial measures (i.e. export growth, market share growth, innovation growth, cost and quality, community development, corporate social responsibility) and implementation of TQM/reengineering practices (Demirbag et al., 2006).

## Research Questions, Objective and Hypotheses

This study addresses a key research question that enable oil and gas managers to understand the structural relationships of TQM, reengineering, operational excellence practices in demand chains, and in supply chains, reformation practices, and sustainable community development program. The research question is how the sequential model of TQM—Reengineering strategy—sustainable community development links should be considered by the oil and gas managers?

The objective of the study is to validate the oil and gas companies' claim to total

quality management (TQM) and reengineering practices by determining the structural relationships between TQM practices based on Deming's 14 points, reengineering, operational excellence practices in demand—and supply—chains, and sustainable community development program.

The research framework (Figure 2) which identifies a ten—stage path analytic model (structural model) delineating the factors involved in the relationships between six researches construct. On the basis of a review of the diffusion of distinctive literatures, the researcher posits ten quantitative—deductive research hypotheses to test the effect of TQM and reengineering (independent variables) through Operational Excellence practices in downstream and upstream sectors, reformation practices (intervening/mediating variables) on sustainable community development program (a dependent variable). The theoretical model leads to the following hypotheses:

- H1: TQM has a direct and significant effect on Operational Excellence practices in Demand Chain.
- H2: TQM has a direct and significant effect on Operational Excellence practices in Supply Chain.
- H3: TQM has a direct and significant effect on Reformation practices.
- H4: Reengineering has a direct and significant effect on Operational Excellence practices in Demand Chain.
- H5: Reengineering has a direct and significant effect on Operational Excellence practices in Supply Chain.
- H6: Reengineering has a direct and significant effect on Reformation practices.
- H7: Reengineering has a direct and significant effect on Sustainable Community Development Program.
- H8: Operational Excellence practices in Demand Chain has a direct and significant effect on Reformation practices.

- H9: Operational Excellence practices in Supply Chain has a direct and significant effect on Reformation practices.
- H10: Reformation practices has a direct and significant effect on Sustainable Community Development Program.

## Method

Two thousand and eight hundred (2800) questionnaires were distributed to the participating (49) oil and gas companies in a qualified sample of 140 SBUs. A total of 1,332 individual usable questionnaires were returned thus qualified for analysis, representing an effective response rate of 50.19 percent. Of these, 354 were from high level managers, 447 from middle level managers, and 531 from low level managers (stratified random sampling). This was considered appropriate to run the AMOS program (Black, 1994)—using structural equation modeling or SEM 13.0 (Coakes et al., 2006) and structural relationships analyses). This research used a quantitative—deductive (theory—driven) method design (the explanatory design). The primary unit of analysis of the study is individual managers at the Strategic Business Unit (SBU) level in the Indonesia's oil and gas industry. The survey was administered to every level of management at each SBU (Top, Middle, and Low Level Management).

A multiple informant sampling unit was used to ensure a balanced view of the relationships between the research constructs, and to collect data from the most informed respondents on different level of management. The surveys and data for testing the research hypotheses were collected during five months through traditional postal questionnaire surveys, and internet or questionnaire e-mailed/web surveys to distribute and to complete the questionnaires (the importance and performance questionnaire) directly at a single point in time (a cross—sectional study).

The researcher borrowed the original

version of the questionnaires (in English) from the previous studies and then translated it into Indonesian language using the back—translation method, so nothing any discrepancies (Brislin, 1986). During the translation process, the wording of some items adapted to achieve a meaning in Indonesian language closer to the original meaning in English. Each manager completed the questionnaire and provided feedback regarding the wording of items, their understandability, and the overall organization of the instrument. The measurement instrument was adjusted accordingly based on their feedback. Participants answered using a five—point Likert—type scale ranging from not at all true to completely true and from poor to excellent. The second version of the questionnaire in Indonesian language was used in the survey.

An assessment of non response bias was made by using the extrapolation approach recommended by Armstrong (1979). Each individual questionnaire type (high, middle, and low level managers) was categorized by the date the completed questionnaire was received. Tests revealed no significant differences between early responders (the first wave of responses;  $n = 442$ ) and late responders (the second wave of responses;  $n = 890$ ) on any of the constructs. As indicated by a CFI (the comparative fit index) of 0.950 for the research model, the multi group models represent excellence fit to the data. As such, non—response bias is unlikely to be present in this data (Morgan and Piercy, 1998).

## Data Analysis and Results

Data analysis for this study involved two major steps: the data reduction process and the structural relationship analysis. The data reduction process aimed to reduce the number of variables and parameters in the research model to manageable number in terms of the ratio between sample size and parameter estimated in the structural equation modeling

(SEM) (Projogo and Sohal, 2002). The structural relationships analysis was used to examine the simultaneous relationship among TQM, reengineering, operational practices in upstream/supply—chain and downstream/demand—chain sectors, reformation, and sustainable community development.

The data reduction process was conducted in order to collapse the six constructs—each consisting of two to fourteen items—employed in this study into composite variables. Two constructs (TQM and reengineering) constituted independent variables; three constructs (operational excellence practices in supply—chain, operational excellence in demand—chain, reformation) constituted three mediating /intervening variables; and sustainable community development (company non financial performance) constituted dependent variable. These six constructs were subjected to validity and reliability tests before a single score can be calculated to represent each construct. Confirmatory factor analysis (CFA) using SPSS 13.0 was employed for examining construct validity of each scale by assessing how well the individual item measured the scale. All items loaded on their predicted factors with values of 0.60 or better. The goodness of fit indices (GFI) of the six constructs exceeded the 0.9 criterion suggested by Kelloway (1998) in Projogo and Sohal (2002), hence, establishing the construct validity. The reliability analysis was conducted by calculating the Cronbach's alpha for each scale. The result shows that the Cronbach's alpha measure for the six constructs exceed the threshold of 0.7 suggested by Nunnally

(1967). The final results of construct validity and reliability tests of the six constructs are reported in Table 2. Having met the requirement of construct validity and reliability, the composite measure of each construct can be measured by calculating their mean values (Hair et al., 2006). The results are presented in Table 2.

SEM using AMOS was employed for examining the relationships among the six research constructs. Table 3 shows that the goodness—of—fit indexes for the saturated measurement model (the Initial/Original Model) reflected a mediocre model ( $X^2/df = 9.882$ ,  $p = 0.000$ ,  $GFI = 0.990$ ,  $AGFI = 0.946$ ,  $CFI = 0.991$ ,  $RMR = 0.018$ , and  $RMSEA = 0.082$ ). Values of 0.90 and above on the adjusted goodness—of—fit (AGFI) indexes are considered desirable, and values of 0.95 and above on the comparative fit index (CFI) are considered strong evidence of practical significance (Bentler & Bonett, 1989). Standardized root—mean—squared residual (RMR) values and root—mean—squared error of approximation (RMSEA) values of 0.05 or less are also considered indicators of good fit.

The paths from TQM to operational excellence in supply chain (SC); from TQM to reformation (REF); reengineering (RE) to reformation (REF), and from operational excellence in demand chain (DC) to reformation (REF) have critical ratio (CR) less than 1.96 (see Figure 5. Initial Structural Model). Therefore, the paths from TQM to SC, TQM to REF, and DC to REF were eliminated and the model was revised (see Figure 4. Final Structural Model).

Table 2. Construct Validity and Reliability and Values for Composite Measures

Construct	No. of items (final)	Goodness of fit index	Means	Standard deviation	Cronbach's alpha
TQM	14	0.9550	2.4372	0.583	0.8560
Reengineering	4	0.9800	3.3450	0.710	0.8880
OE in DC	4	0.9710	3.4540	0.668	0.8625
OE in SC	5	0.9450	2.9503	0.684	0.8106
Reformation	2	0.9665	2.6922	0.877	0.8776
SCDP	7	0.9712	2.7570	0.717	0.8229

Table 3. SEM Results (The Initial/Original Model)

Hypothesis	Structural Relation (Causal Paths)	Unstandardized Regression Weights (y)	CR	error ( $\epsilon$ )	Residual ( $\zeta$ )	Hypothesis Supported?
H1	DC <----TQM	0.129	2.797	$\epsilon_{TQM} = 0.093$	$\zeta_{DC} = 0.327$	Yes
H2	SC <----TQM	0.053	<b>0.800</b>	$\epsilon_{RE} = 0.160$	$\zeta_{SC} = 0.968$	No
H3	REF <----TQM	0.057	<b>1.099</b>	$\epsilon_{DC} = 0.069$	$\zeta_{REF} = 0.462$	No
H4	DC <---- RE	0.709	15.128	$\epsilon_{SC} = 0.151$	$\zeta_{SCDP} = 0.196$	Yes
H5	SC <---- RE	0.130	1.963	$\epsilon_{REF} = 0.218$		Yes
H6	REF <---- RE	0.083	<b>1.227</b>	$\epsilon_{SCDP} = 0.131$		No
H7	SCDP <---- RE	0.480	2.196			Yes
H8	REF <---- DC	0.040	<b>0.817</b>			No
H9	REF <---- SC	0.680	27.753			Yes
H10	SCDP <---- REF	0.881	37.816			Yes
<b>Goodness of Fit Measures</b>			<b>Acceptable Parameter Level (Hair et al., 2006)</b>		<b>Desirable Parameter Level (Hair et al., 2006)</b>	
Chi-Square Statistic ( $X^2$ )		39.527	$1 < x < 5$		$1 < x < 2$	
Degree of Freedom (df)		4				
Normed Chi-Square ( $X^2/df$ )		9.882	Close to 1 is better			
GFI		0.990	> 0.90			
AGFI		0.946	Close to 1 is better			
CFI		0.991	Close to 0 is better			
RMR		0.018	< 0.10		< 0.05	
RMSEA		0.082	> 0.05		> 0.15	
P		0.000	< 0.05			
ECVI		0.032				

Note: TQM=Total Quality Management; RE/ReEng=Reengineering; DC=Operational Excellence Practices in Demand-Chain or Downstream; SC=Operational Excellence Practices in Supply-Chain or Upstream; REF=Reformation Practices based on the Amendment of Law of Oil and Gas No.22/2001; SCDP=Sustainable Community Development Program

Figure 3. Initial Structural Model

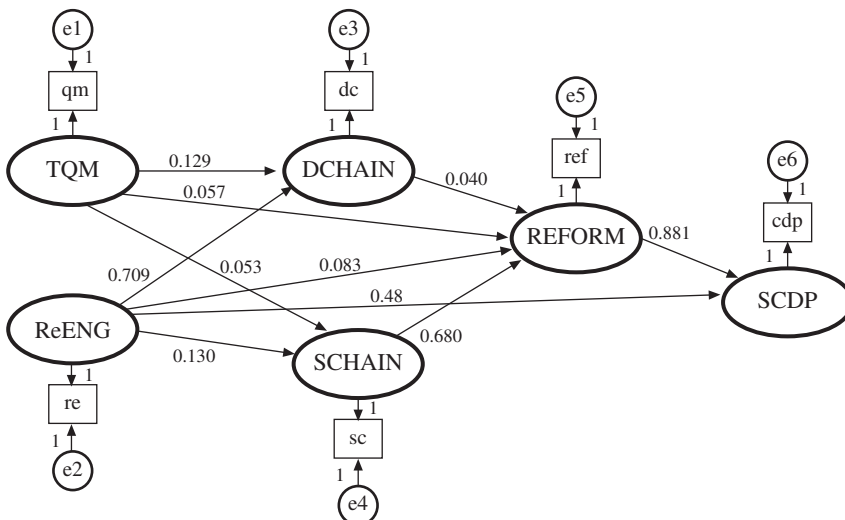


Table 4 shows the revised (final) structural model. After eliminating the paths from TQM to SC, TQM to REF, and DC to were iteratively used to determine whether the structural model fitted the data well. The criteria for assessing overall fit support a well-fitting model ( $X^2/df < 2$ ; GFI, AGFI, CFI  $> 0.95$ ; RMR and RMSEA  $< 0.05$ ; and p-value  $> 0.05$ ). In finalizing this revision on structural model assessment, Table 4 summarizes the results of testing each hypothesis and the associated causal path (Figure 4). Hypotheses H2; H3; and H8 are not supported. With some modifications the results of the final model support hypotheses H1, H4, H5, H6, H7, H9, and H10.

This result also provides important

insights into the lower and smallest all ECVI values (Expected Cross-Validation Index) from the initial model (ECVI = 0.032), and final causal model (ECVI = 0.032). According to Byrne (2001) the structural model having the smallest ECVI values exhibits the greatest potential for replication. In assessing the hypothesized for the structural model (Final Causal Model) I compare its ECVI value of 0.032 with that of both the saturated model (ECVI = 0.031) and the independence model (ECVI = 3.065). Given the lower ECVI value for the hypothesized model, compared with both the independence and saturated models, I conclude that it represents the best fit to the data.

Table 4. SEM Results (The Final/Contending Model)

Hypothesis	Structural Relation (Causal Paths)	Unstandardized Regression Weights (y)	CR	error ( $\epsilon$ )	Residual ( $\zeta$ )	Hypothesis Supported?
H1	DC <--- TQM	0.124	2.681	$\epsilon_{TQM} = 0.093$	$\zeta_{DC} = 0.326$	Yes
H2	SC <---TQM (Deleted)	-	-	$\epsilon_{RE} = 0.160$	$\zeta_{SC} = 0.968$	No
H3	REF <---TQM (Deleted)	-	-	$\epsilon_{DC} = 0.069$	$\zeta_{REF} = 0.511$	No
H4	DC <---RE	0.714	15.189	$\epsilon_{SC} = 0.151$	$\zeta_{SCDP} = 0.245$	Yes
H5	SC <---RE	0.177	5.961	$\epsilon_{REF} = 0.218$		Yes
H6	REF <---RE	0.173	6.811	$\epsilon_{SCDP} = 0.131$		Yes
H7	SCDP <---RE	0.092	3.958			Yes
H8	REF <---DC (Deleted)	-	-			No
H9	REF <---SC	0.647	25.305			Yes
H10	SCDP<---REF	0.737	21.654			Yes
Goodness of Fit Measures		Acceptable Parameter Level (Hair et al., 2006)		Desirable Parameter Level (Hair et al., 2006)		
Chi-Square Statistic ( $X^2$ )	11.583	$1 < x < 5$ Close to 1 is better $> 0.90$ Close to 1 is better Close to 0 is better		$1 < x < 2$      $< 0.05$ $> 0.15$		
Degree of Freedom (df)	6					
Normed Chi-Square ( $X^2/df$ )	1.931					
GFI	0.997					
AGFI	0.990					
CFI	0.999					
RMR	0.013					
RMSEA	0.026	$< 0.10$		$< 0.05$		
P	0.072	$> 0.05$		$> 0.15$		
ECVI	0.032	$< 0.05$				

Note: TQM=Total Quality Management; RE/ReEng=Reengineering; DC=Operational Excellence Practices in Demand-Chain or Downstream; SC=Operational Excellence Practices in Supply-Chain or Upstream; REF=Reformation Practices based on the Amendment of Law of Oil and Gas No.22/2001; SCDP=Sustainable Community Development Program

Figure 4. Final Structural Model

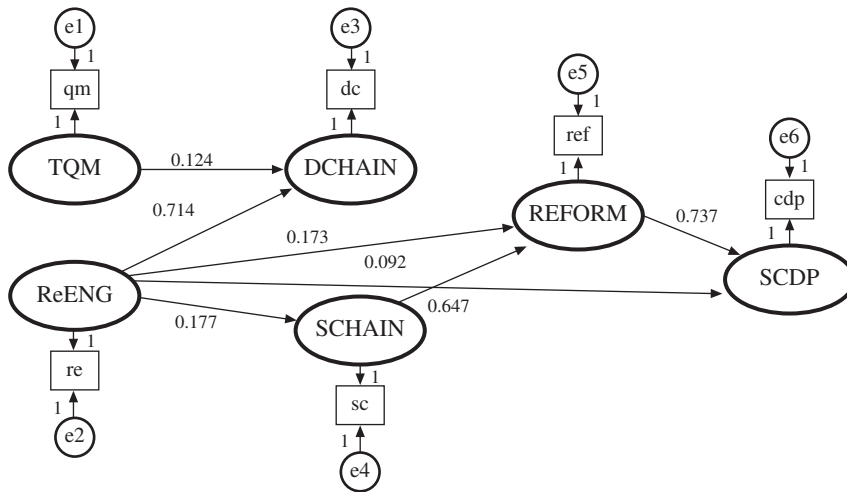


Table 5. A Complete Model Fit: Initial vs Final Model

Goodness-of- Fit Statistics Test	Model Fit for		Acceptable Parameter Level for		
	Initial Model	Final Causal Model	The Criteria of Hair et al., 2006	Initial Model	Final Causal Model
Chi-Square Statistic ( $X^2$ )	39.527	11.583			
Degree of Freedom (df)	4	6			
Normed Chi-Square ( $X^2/df$ )	9.882	1.931	$1 < x < 5$	No	Yes
GFI	0.990	0.997	Close to 1 is better	Yes	Yes
AGFI	0.946	0.990	$> 0.90$	Yes	Yes
CFI	0.991	0.999	Close to 1 is better	Yes	Yes
RMR	0.018	0.013	Close to 0 is better	Yes	Yes
RMSEA	0.082	0.026	$< 0.05$	No	Yes
P	0.000	0.072	$> 0.05$	No	Yes
ECVI	0.032	0.032	$< 0.05$	Yes	Yes

Table 5 shows a complete model fit and the acceptable parameter level of the research constructs which indicate the overall parameter of final or contending model are good fit between the hypothesized model and the observed data. The author compares the model fit for original and final, the results of the final model suggest that the hypothesized models are well-fitting and represent reasonable approximation to the population. The examinations to find these goodness-of-fit statistics of the final model with respect to the acceptable parameter level have encouraged the author to seek some

modifications of the hypothesized models in the efforts to attain adequate fit to the data.

## Discussion

This study examined sequential model that defines structural relationships among six constructs that are relevance to reformation practices in the Indonesia's oil and gas industry (a single industry). The research constructs are TQM, Reengineering, Operational Excellence in Demand Chain, and Operational Excellence in Supply Chain, Reformation, and Sustainable Community

Development Program. The model is developed based on findings and conceptualizations of the compilation from previews studies. This study has moved from anecdotes and case studies to a testable model and multiple research hypotheses, linking the real reformation practices to sustainable community development program. This investigation is believed to make a contribution to the debate of the rhetoric reformation by providing empirical evidence of the real reformation practices from a single industry (oil and gas) that has a set of unique characteristics that offer additional insights into the question and also mitigate some of the measurement problems of earlier research.

As time passed, the Indonesia's oil and gas industry began recognizing that Reengineering and TQM need not operate in isolation from other changes initiative programs (i.e., operational excellence practices)—it could be integrated. In summary, seven causal paths specified in the hypothesized model were found to be positive and statistically significant. Overall, the results of SEM indicate that Reengineering significantly and positively relates to operational excellence practices in demand-chain and supply-chain as well as reformation and sustainable community development, hence supporting the positive argument for the relationship between quantum leap innovation and company performance outlined in the literature review section. Although TQM had no significant direct effects on operational excellence in operational excellence practices in supply-chain, reformation and sustainable community development program, TQM did have significant positive effects on operational excellence in demand chain (downstream sector). The SEM result, however also indicates that the explanatory power of reengineering (quantum leap innovation) is higher toward operational excellence practices in demand-chain than TQM. In addition, downstream sector (demand-chain activities)

needs the integration between TQM and Reengineering; and upstream sector (upstream activities) need more focus on reengineering.

From TQM (continuous improvement) point of view, it is essential to appreciate that the quality guru's conception of quality (Deming, 1982) is meeting reliable and consistent standards in line with customer (society) requirements. Therefore, while the result has demonstrated that TQM has a positive and significant relationship with operational excellence practices in demand-chain (downstream sector), it also implies that TQM in its own right is less explanatory power toward operational excellence in demand-chain than reengineering.

From reengineering (quantum leap innovation) point of view, the positive results on the relationship between reengineering and sustainable community development as well as reformation and operational excellence in supply and demand-chains provide an important confirmation. Under the context of reengineering, TQM is considered as one form of innovation (Cooper, 1998; Westphal et al., 1997; Yamin et al., 1997 in Prajogo and Sohal, 2002). TQM and reengineering recognize the importance of processes, and they both start with the needs of the process customer and work backwards from there. However, the two programs also differ fundamentally. TQM programs seek steady incremental improvement to process performance. Reengineering programs seek breakthroughs, not by enhancing existing processes, but by discarding them and replacing them with entirely new ones. Reengineering involves, as well, a different approach to change management from that needed by TQM programs (Hammer and Champy, 1993). Hammer and Champy also stated that the companies cannot do reengineering without TQM. Nowak (1997) in Prajogo and Sohal (2002) suggests in practice, because self-reinforcing and dual-direction character of the impact quality improvement (TQM) and innovation

(reengineering) have on one another, firms seek quality through innovation or innovate (reengineer) through quality improvement (TQM)—the integration between TQM and reengineering. Based on the final structural/sequential model of the study, reformation has direct and strong effect on sustainable community development. It means that the fair and free reward (recognition) and punishment (law enforcement) system are the critical factors for reformation.

Successful implementation of Reformation Strategy requires recognizing the following contributions about the integration between TQM and Reengineering:

1. Reformation must be perceived by society. Reformation work must begin with the community needs analysis. Reformation actions are only meaningful when they are perceived by the society (the people) in order to build sense of belonging culture.
2. Reformation requires reengineering (quantum leaps). Although reformation should be continuously improved, it pays for a nation to sometimes target a quantum leap innovation. Small improvements are often obtainable through working harder. But large innovations call for fresh solutions, for working smarter is being required—how to move from Political Organization to Proactive Organization: to decrease the external control (i.e. the dependency with international financial institution) and to increase the internal capacity (i.e. to increase the nation competitiveness and the competencies of the society) simultaneously. Based on the above considerations, the author redefines Reformation as follows:

*“Reformation is the amendment of life to bring the society by force or persuasion to give-up misconduct and behave better; a thorough and comprehensive change (the integration between reengineering and TQM) of making*

*better quality of life by removing faults and wastes, by putting a stop to abuses or malpractices, and by empowering better procedures in order to gain the better nation competitiveness.*

According to Higginson and Waxler (1994) and Schonberger (1994) the integration of reengineering and TQM strategies absolutely require the following characteristics in order to be successful:

- Good communication—a clear and simple communication practices and channels backed by a full and inclusive understanding of the vision, mission, goals, objectives and strategies involved.
- Extensive support and continuous articulation of that support in word and deed from top management—top management leadership.
- A positive corporate (nation) culture focusing on short-run and long-run benefits and growth potential.
- Teamwork and the cooperation of all employees or citizens involved (employee/society involvement) founded on a democratic sense of the workplace and the meaning of work itself through learning organization in order to be world-class organization.
- To be successfully and self-sustaining, the integration of TQM and reengineering requires extensive changes in cross-functional and interactive decision making.

## Conclusions

In view of the fact that the success of oil and gas industry has a direct impact on the national economy; and the consequences of the realization of new oil and gas law number 22/2001, this study presents new data and empirical insights into the structural relationships among TQM, reengineering, operational excellence practices in upstream

and downstream sectors, reformation, and company non financial performance (sustainable community development) in oil and gas companies operating in Indonesia.

The particular design of the research and the findings suggest that if Reengineering, TQM, Operational Excellence practices in upstream and downstream sectors, and Reformation are properly implemented, sustainable community development program can be improved while also raising the wealth of the society. The combination of these improvements eventually leads to decrease the differences between the rich and the poor; to accelerate the development of entrepreneurship in small and medium-sized enterprises (SMEs); and also to increase the nation competitiveness as well.

Despite the fact that this study develops a sequential model of TQM-Reengineering strategy—sustainable community development links in the field of strategic management, it should also be acknowledged that the study is subject to some methodological limitations. *First*, it would be highly suggested that the size and nature of the sample must be enhanced to ensure variability and control for possible extraneous variation. While the sample is restricted to only a single country and a single industry, it would be strongly recommended that data should be gathered from various countries of ASEAN (Association of Southeast Asian Nations or Ten Nations One Community—Indonesia, Singapore, Malaysia, Brunei Darussalam, Thailand, Philippines, Cambodia, Laos, Myanmar, Vietnam) including both various manufacturing and service industries. *Second*, the data in this study were collected from top, middle, and low levels manager on the basis of their subjective (qualitative) evaluations, objective performance (quantitative) indicators should be employed in the analysis. *Third*, the research reported here is of a purely cross-sectional snapshot. The researcher was unable to test and account for the lags between the

existence of practices and performance changes, nor to trace the progress of particular oil and gas companies in this study, which is a limitation of all such studies. In addition the researcher encourages thinking about whether the models of the study effects vary over time, either because other time the constructs are theoretically important or because the theoretical effect is unstable for some reason. Next research should be conducted longitudinally to observe the progress of improvement efforts. *Finally*, there is a need for further research to develop TQM-Reengineering dynamics model further in theory and practice. To do so, neural network model and triangulation method could be utilized in the future studies to gain additional insights in exploring the structural relationships among TQM-Reengineering strategies, contextual factors of an organization, and company performance (financial and non financial).

## Managerial Implication

Two significant changes in the legal and regulatory environment (i.e., a new development paradigm under the regional autonomy, the amendment of law of the Republic of Indonesia) were introduced. First, a new development paradigm was started in 2001 under the regional autonomy, transferring development authority to local government-led development mechanism. However, there exists two common saying of lack of budget, and lack of authority and dignity on law enforcement in government sectors almost all over Indonesia. These are the obstacles for implementing regional development in Indonesia (Tanimoto, 2004).

Second, the crucial amendment of law of the Republic of Indonesia had been done related to Law No. 22 of 2001:

1. Preparations of future State Owned Oil and Gas Company (Pertamina) organization gradually until 2006;

2. Organization restructuring that had been done during 2002 is termination of Production Sharing Management Directorate from Pertamina Organization in order to activities take over to Executive Board of Oil and Gas according to Government Regulations No. 42/2002 and No. 67/2002.

State Owned Oil and Gas Company (Pertamina) has legally transformed to be PT. Pertamina (Persero) since September 17, 2003 by enactment of Government Regulation No. 31/2003. Pertamina is now under the coordinator of the State Minister of State-Owned Enterprises. Like other contractors, as a business player, Pertamina also hold Cooperation Contract to Oil and Gas Regulatory Body. Due to the transformation to be a Limited Liability Company, Pertamina becomes a pure business entity which is more profit oriented (Pertamina Quality Management System, 2003).

The findings of the study provide a basis for useful managerial implications to upstream and downstream managers as well as the Executive Body (Oil and Gas Upstream Implementing Body) or BPMIGAS and the Regulatory Body (Oil and Gas Downstream Regulatory Body) or BPH MIGAS to consider the implementation of the sequential model of TQM-Reengineering strategy and sustainable community development links.

The overall implication is that the integration between reengineering and TQM certainly provides a sound systemic foundation for managing the real reformation (the issuance of Law No. 22/2001 on Oil and Gas) on which oil and gas companies can further build their competence and capabilities as well as other strategies (operational excellence practices—based on SEHRE or CSR dimensions) to achieve multidimensional competitive advantage, including reformation (reward and law enforcement system) and sustainable community development program.

This study shows that the upstream side

(the high-risk oil and gas activity sector—SEHRE dimensions) needs to develop reengineering (intended) strategy in order to invite the participation of both the foreign and the national private companies in applying for oil and gas exploration and exploitation. In addition the Directorate General of Oil and Gas, Republic of Indonesia should provide the right issue regulations for the awarding process, to evaluate proposals and tenders, to determine which participant shall be awarded a particular contract—order and law, code of conduct, rule of the game, policy consistency. The Executive Body (Oil and Gas Upstream Implementing Body) or BPMIGAS has been authorized to sign the Cooperation Contract and to manage the petroleum operations stipulated in the Cooperation Contract of the business partnership development (Joint Operations Body for Enhanced Oil Recovery or JOB-EOR, Joint Operation Body for Production Sharing Contract or JOB-PSC, Licensing Agreements (Technical Assistance Contract or TAC), Consortium Cooperation System), or acquisition with other firms (Joint Operating Contract or JOC) (Embassy of the USA, 2004). To support its authorization, BPMIGAS is assigned to conduct supervision, evaluation, planning and managing upstream crude oil and gas sales operation as well as market development in line with the national energy policy. BPMIGAS has the aim to maximize the revenue of the government through evaluation and recommendation of crude oil and gas marketing. To do so, it needs to develop an intended strategy (reengineering or quantum leap innovation) based on market evaluation and sellers appointment for the state share of crude oil and gas for the greatest possible benefit for the country. The upstream SBU managers should be more concerned with trying to achieve the better efficiency and productivity levels. Efficiency and productivity are the means of attaining the organization goals. To be efficient and

productive mean to use all resources wisely and cost effectively.

The study also examines that the downstream side needs to integrate reengineering (intended strategy) and TQM (adaptive strategy). This integration attempts to control the distribution of oil-based fuel and transmission of natural gas for domestic and international markets effectively which led by the Regulatory Body (Oil and Gas Downstream Regulatory Body) or BPH MIGAS. The downstream managers should be more concerned with trying to gain the benefits from operational reliability and

effectiveness. Effectiveness is the organization's ends. To be effective means to achieve results, to make the right decisions and to successfully carry them out so that they achieve the organization's goals and simultaneously to support the nation competitiveness. In addition downstream SBU managers should emphasize on generating continuous improvement on T&D efforts, and quantum leap innovation on R&D to develop sense of belonging culture in implementing operational excellence practices (CSR dimensions) through Triple—A strategy (Agility, Adaptability, Alignment).

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