RINGKASAN

Pengaruh Aplikasi Teknologi Informasi Terhadap Faktor-Faktor Rancang Bangun Perusahaan dan Keunggulan Kompetitif Industri Manufaktur di Indonesia

Upaya peningkatan keunggulan kompetitif berbagai produk manufaktur, memerlukan suatu strategi yang meliputi proses menetapkan bagaimana manufaktur akan mencapai tujuan bisnisnya di masa yang akan datang. Keunggulan kompetitif manufaktur suatu negara akan dibangun dari keunggulan kompetitif pada tingkat perusahaan terlebih dahulu,

Teknologi Informasi telah banyak dipertimbangkan oleh para industriawan sebagai alat untuk mencapai keunggulan kompetitif industri manufaktur yang berkesinambungan.

Keunggulan kompetitif industri manufaktur yang dapat dicapai dengan aplikasi Teknologi Informasi antara lain ialah meningkatkan efisiensi perusahaan manufaktur, percepatan proses diferensiasi produk, peningkatan kualitas produk dan membuka peluang untuk menciptakan bisnis yang baru. Adapun deskripsi dari komponen keunggulan kompetitfi ialah (1) Efisiensi perusahaan manufaktur merupakan suatu kondisi yang sangat diharapkan untuk menekan berbagai biaya operasional perusahaan yang selanjutnya akan dapat menaikkan marjin keuntungan. (2) Percepatan diferensiasi produk, Teknologi Informasi dapat meningkatkan kemampuan perusahaan untuk mengalihkan proses produksi dari satu produk ke produk yang lain tanpa adanya biaya yang berarti dan penguluran waktu dan memiliki kemampuan untuk memproduksi dalam skala kecil, (3) Peningkatan kualitas produk melalui kemampuan untuk merespon permintaan pelanggan dengan reduksi *lead time*. Teknologi Informasi dapat digunakan untuk meningkatkan kualitas produk manufaktur yang selanjutnya mampu membantu perusahaan untuk mempertahankan pelanggan. (4) Teknologi Informasi dapat digunakan sebagai alat untuk menciptakan bidang usaha yang baru, sehingga terjadi pembiakan bidang usaha yang akan mendatangkan keuntungan tambahan bagi perusahan dan ikut mendorong menciptakan citra positif bagi perusahaan karena kemampuannya dalam melakukan berbagai usaha baru.

Faktor-faktor rancang bangun perusahaan yang berpengaruh terhadap keberhasilan aplikasi Teknologi Informasi antara lain meliputi pelatihan teknologi informasi, rekayasa ulang proses bisnis, disain sistem, manajemen teknologi dan perencanaan produksi yang ada didalam perusahaan..

Tiga faktor yang berkontribusi positif terhadap pencapaian keunggulan kompetitif ialah (1) Rekayasa ulang proses bisnis dalam perusahaan perlu dilakukan untuk meningkatkan efektifitas penggunaan peralatan yang berbasis Teknologi Informasi tersebut. Aplikasi Teknologi Informasi di perusahaan perlu dilakukan secara konsisten dengan cara

melakukan berbagai penyesuaian proses operasi dan perubahan struktur organisasi. (2) Disain sistem atau *"System design"* adalah suatu proses yang sangat menentukan kebermanfaatan sistem Teknologi Informasi dalam operasi bisnis. (3) Perencanaan produksi yang didukung oleh Teknologi Informasi akan mampu meningkatkan keunggulan kompetitif industri manufaktur. Sedangkan dua faktor yang lain cenderung sebagai beban perusahaan dan dapat menurunkan keunggulan kompetitif perusahaan ialah (1) Pelatihan Teknologi Informasi ialah program pelatihan untuk para staf operator perusahaan dan (2) Manajemen teknologi ialah suatu program perencanaan inovasi untuk penguasaan teknologi dalam meningkatkan daya saing perusahaan.

Disertasi ini bertujuan untuk mengkaji pengaruh aplikasi Teknologi Informasi terhadap faktor-faktor rancang bangun perusahaan dan keunggulan kompetitif industri manufaktur. Studi ini dilakukan terhadap industri manufaktur dengan sampel 180 responden yang diambil secara convenient

Disertasi ini merupakan pengembangan dan integrasi dari berbagai penelitian dalam bidang manajemen Teknologi Informasi terdahulu yang dilakukan secara parsial oleh Dhanani (2000) Jantan dan Srinisavaraghavan (1996), Porter *and* Millar (1985), Chin Fu Ho (1998), Dasgupta *et al.,*(1999), Choi Leng Ang (2000), .Chan (2000), Sohal *et al.*,(2001), Khalil *et al* .,(2000), Lacovou (1995), Wells (2000).

Penelitian ini merupakan suatu penelitian kausalitas. Data penelitian dikumpulkan menggunakan instrumen kuesioner yang didistribusikan terhadap 300 manajer produksi dan operasi pada industri manufaktur di Indonesia.

Analisis data dilakukan dengan menggunakan analisis *Structural Equation Modeling (SEM)* dengan bantuan program AMOS 4.01 untuk menguji pengaruh aplikasi Teknologi Informasi terhadap faktor-faktor rancang bangun perusahaan dan keunggulan kompetitif industri manufaktur

Hasil studi ini menunjukkan bahwa: (1) Aplikasi teknologi berpengaruh positif dan signifikan terhadap keunggulan kompetitif industri manufaktur. Hal ini telah dibuktikan dengan adanya nilai koefisien jalur *direct effect* 0,269 dan *p-value* sebesar *fix,* (2) Aplikasi Teknologi Informasi berpengaruh positif dan signifikan terhadap pelatihan Teknologi Informasi. Hal ini telah dibuktikan dengan adanya nilai koefisien jalur *direct effect* 0,813 dan *p-value* sebesar 0,000, (3) Pelatihan Teknologi Informasi berpengaruh negatif dan signifikan terhadap keunggulan kompetitif industri manufaktur. Hal ini telah dibuktikan dengan adanya nilai koefisien jalur *direct effect* –0,016 dan *p-value* sebesar *fix,* (4) Aplikasi Teknologi Informasi berpengaruh positif dan signifikan terhadap rekayasa ulang proses bisnis. Hal ini telah dibuktikan dengan adanya nilai koefisien jalur *direct effect* 0,692 dan *p-value* sebesar 0,000, (5) Rekayasa ulang proses bisnis berpengaruh positif dan signifikan terhadap keunggulan kompetitif industri manufaktur. Hal ini telah dibuktikan dengan adanya nilai koefisien jalur *direct effect* 0,299 dan *p-value* sebesar *fix,* (6) Aplikasi Teknologi Informasi berpengaruh positif dan signifikan terhadap disain sistem. Hal ini telah dibuktikan dengan adanya nilai koefisien jalur *direct effect* 0,583 dan *p-*

value sebesar 0,000, (7) Disain sistem berpengaruh positif dan signifikan terhadap keunggulan kompetitif industri manufaktur. Hal ini telah dibuktikan dengan adanya nilai koefisien jalur *direct effect* 0,086 dan *p-value* sebesar *fix,* (8) Aplikasi Teknologi Informasi berpengaruh positif dan signifikan terhadap manajemen teknologi. Hal ini telah dibuktikan dengan adanya nilai koefisien jalur *direct effect* 0,623 dan *p-value* sebesar 0,000, (9) Manajemen teknologi berpengaruh negatif dan signifikan terhadap keunggulan kompetitif industri manufaktur. Hal ini telah dibuktikan dengan adanya nilai koefisien jalur *direct effect* –0,089 dan *p-value* sebesar *fix,* (10) Aplikasi Teknologi Informasi berpengaruh positif dan signifikan perencanaan produksi. Hal ini telah dibuktikan dengan adanya nilai koefisien jalur *direct effect* 0,718 dan *p-value* sebesar 0,000, (11) Perencanaan produksi berpengaruh positif dan signifikan terhadap keunggulan kompetitif industri manufaktur. Hal ini telah dibuktikan dengan adanya nilai koefisien jalur *direct effect* 0,496 dan *p-value* sebesar *fix.*

Hasil studi ini tidak mendukung atau tidak mengkonfirmasi hasil studi sebelumnya sebagaimana yang dinyatakan oleh Indrajit (2000) yang menyatakan bahwa pelatihan dalam bidang Teknologi Informasi merupakan alat yang fundamental dalam melengkapi karyawan dengan kemampuan untuk mengadaptasi berbagai perubahan kondisi bisnis secara berkesinambungan, West (1992) yang menyatakan bahwa program inovasi yang teratur untuk membentuk nilai suatu produk merupakan hal penting bagi industri manufaktur untuk mengembangkan keunggulan kompetitifnya..

Dari 5 (lima) faktor rancang bangun perusahaan yang digunakan dalam studi ini 3 (tiga) diantaranya yaitu disain sistem, rekayasa ulang proses bisnis dan perencanaan produksi sebagai variabel *moderating* dapat mendukung pengoptimasian Teknologi Informasi untuk meningkatkan keunggulan kompetitif industri manufaktur di Indonesia. Sedangkan 2 (dua) faktor rancang bangun dalam perusahaan yang lain pelatihan Teknologi Informasi dan manajemen teknoloai tidak memperkuat aplikasi Teknologi Informasi untuk meningkatkan keunggulan kompetitif pada industri manufaktur dan bahkan kedua faktor ini dilihat sebagai beban perusahaan.

Saran-saran yang diajukan studi ini ialah bahwa (1) Aplikasi Teknologi Informasi sebagai upaya peningkatan keunggulan kompetitif industri manufaktur hendaknya direncanakan dengan cermat dan dengan perhitungan investasi yang memasukkan faktor-faktor *intangible*.. (2) Pemerintah Indonesia hendaknya terus membangun infrastruktur bisnis yang berbasis Teknologi Informasi untuk meningkatkan keunggulan kompetitif industri manufaktur, (3) Program pelatihan Teknologi Informasi hendaknya memperoleh perhatian yang memdai dalam arti materi pelatihan maupun kesesuaian petugas yang dilatih. (4) Para pemimpin industri manufaktur perlu secara bertahap meningkatkan program inovasi untukm meningkatkan daya saing perusahaan. (5) Untuk penelitian selanjutnya dalam bidang kajian yang sama disarankan untuk meneliti pengaruh pelatihan terhadap peningkatan keunggulan kompetitif industri manufaktur dan pengaruh manajemen teknologi terhadap keunggulan kompetitif industri manufaktur karena dalam penelitian ini menunjukkan gejala paradoks terhadap berbagai teori yang ada.

SUMMARY

The Impact of Information Technology Aplication to the Enterprise Design Factors and Competitive Advantage of Manufacturing Industries in Indonesia

The efforts improving competitive advantage of various manufacturing products requires strategies that cover various processes in setting how manufacturing industries will achieve its future business objectives. Competitive advantage of manufacturing industries of a nation will be first built up on the competitive advantage at the enterprise level.

Information technology has been considered by industrialist as enabler to achieve the sustainable competitive advantage of manufacturing industries.

The competitive advantage of manufacturing industries, which will be achieved through the implementation of Information Technology are improving manufacturing efficiency, expediting products differentiation process, improving products quality and creating opportunity in spawning new business. Further description of Information Technology Competitive Advantages ar4e as follows (1) Operating efficiency is an expected condition to lower the operating cost and increasing profit margin of the manufacturing enterprises. (2) Expediting products differentiation, Information Technology will enable enterprise to switch the manufacturing process from a certain product to another products with very minimum effect to operating cost and time delay and having ability to produce any products in a small scale, (3) Improving products quality, Information Technology increases ability to response customer requirements with minimum lead-time. Information technology is also able to improve the manufacturing products quality to maintain customer and market share. (4) Spawning new business, Information technology will also increase ability in spawning new business and create extra benefit and positive image of the manufacturing enterprise in creating any new products.

The enterprise design factors, which share a certain extent influence to the success of information technology application, are training in information technology, business process reengineering, system design, technology management and production planning within the enterprise. Further description of enterprise design factors, which contribute positive influence to achive the competitive advantage are as follows (1) Business process reengineering in an enterprise is important to improve intensity and effectively in using information technology based equipment. The application of information technology based equipment need to be handled consistently through various adjustment of the manufacturing business process, (2) System design is a very important process to determine the success of implementation of information technology based equipment to

operate manufacturing business. (3) Production planning, which is supported by information technology based equipment will enable to improve the competitive advantage of manufacturing industries.

While the other two enterprise design factors are considred as burden the the enterprise are (1) Training of Information Technology, this is training program provided for the staff in operating Information Technology based equipment, (2) Maanagement Technology, this is a process in inovation planning and improving capacity in mastering technology.

The objectives of this dissertation are to investigate the role of information technology application to enterprise design factors and the competitive advantages of the manufacturing industries.

There are hundred eighty respondents as samples which are taken conveniently from the population for this study. This dissertation as an effort to improve and integrate of the former research in the area of information technology management, which are under taken by Porter and Millar (1985), Jantan and Srinisavaraghavan (1996), Chin Fu Ho (1998), Dasgupta et al., (1999), Dhanani (2000), Choi Leng Ang (2000),. Chan (2000), Khalil *et al.,* (2000), Lacovou (2000), Wells (2000), Sohal *et al.,* (2001).

This study is as causality research, data has been collected through questionnaires, which are distributed to production and operation managers of the manufacturing industries in Indonesia.

The Structural Equation Modeling is used to analyze the data through the assistant of AMOS 4.01 software to prove the impact of information technology application to the enterprise design factors and the competitive advantages of the manufacturing industries.

The results of this study provide the following indication: (1) The application of information technology has positive impact and significant to the competitive advantage of the manufacturing industries. This result has been proved quantitatively and the calculated direct effect path coefficient is 0.269, and p-value is fix. (2) The application of information technology has positive impact and significant to the training of information technology. This result has been proved quantitatively and the calculated direct effect path coefficient is 0.813, and p-value is 0.000. (3) The training of information technology has negative impact and significant to the competitive advantage of manufacturing industries. This result has been proved quantitatively and the calculated direct effect path coefficient is –0.016, and p-value is fix. (4) The application of information technology has positive impact and significant to the business process reengineering. This result has been proved quantitatively and the calculated direct effect path coefficient is 0.692, and p-value is 0.000. (5) The business process reengineering has positive impact and significant to the competitive advantage of manufacturing industries. This result has been proved quantitatively and the calculated direct effect path coefficient is 0.299, and p-value is fix. (6) The application of information technology has positive impact and significant to system design. This result has been proved quantitatively and the calculated direct effect path coefficient is 0.583 and p-

value is 0.000. (7) The system design has positive impact and significant to the competitive advantage of manufacturing industries. This result has been proved quantitatively and the calculated direct effect path coefficient is 0.086, and p-value is fix. (8) The application of information technology has positive impact and significant to technology management. This result has been proved quantitatively and the calculated direct effect path coefficient is 0.623, and p-value is 0.000. (9) The management technology has negative impact and significant to the competitive advantage of manufacturing industries. This result has been proved quantitatively with the direct effect path coefficient is –0.089, and p-value is fix. (10) The application of information technology has positive impact and significant to the production planning. This result has been proved quantitatively and the calculated direct effect path coefficient is 0.718, and p-value is 0.000. (11) The production planning has positive impact and significant to the competitive advantage of manufacturing industries. This result has been proved quantitatively and the calculated direct effect path coefficient is 0.496, and p-value is fix.

The result of this study is not confirming to the former research as stated by Indrajit (2000) saying that training in information technology plays a very important role in furnishing the technician with the required competencies to meet the need of future business. West (1992) stated that the regulated innovation plan plays a pivotal role in developing competitive advantages of manufacturing industries.

This study provides the following suggestions (1) The application of information technology in manufacturing industries should be well planned in advance and involving intangible aspect in calculating return on investment. (2) The Indonesia Government should continuously develop information technology based infrastructure to improve the competitive advantages of manufacturing industries in Indonesia., (3) The training program in Information Technology require serious attention in term of training content and the suitability of the staffs sent., (4) The industrialist should consider the inovation program through mastering production technology for increasing competitive advantage. (5) For the next research in the similar information technology management area, it is suggested to reinvestigate the impact of training in information technology to the competitive advantages of and the impact of technology management to the competitive advantages of manufacturing industries. The idea in proposing these two reinvestigations is because the finding in this study is considered paradox to the available theories.

ABSTRACT

The Impact of Information Technology Aplication to the Enterprise Design Factors and Competitive Advantage of Manufacturing Industries in Indonesia

The current globalization era will bring manufacturing industries to a sharper global competition. The one who win in the competition, are those having competitive advantage. The competitive advantages of manufacturing industries are characterized by having operation efficiency, suitable products, quality products and opportunity to spawn new business. The manufacturing industries, those are not efficient and less competitive, they will soon disappear and out of market.

This study is assessing the application of Information Technology in manufacturing industries to increase its competitive advantage. The application of Information Technology in this study is defined in the form of computer integrated manufacturing (CIM) system, which will cover the following activities (1) office automation (2) manufacturing resources planning system (3) manufacturing communication (4) computer aided product design and (5) manufacturing process system.

Application of Information Technology in manufacturing process will leverage the competitive advantage of manufacturing industries, as it will increase business operation efficiency, faster products differentiation, products quality improvement, and spawning new business,

However investment in information technology is considered costly, require long-term preparation and need strong coordination in all aspect of the manufacturing organization. Information Technology investment should be well planned and calculated accordingly to avoid the unnecessary lost due to the disability in operating the Information Technology based equipment system

Enterprise design factors of manufacturing industries such as training, business process re-engineering, system design, technology management and production planning as part of the integrated system of manufacturing industries will suppoirt and intensify the utility of Information Technology based equipments to bring about the competitive advantage of manufacturing industries in Indonesia.

It is suggested that full and thorough understanding to the role of Information Technology based equipment will enable enterprise in reducing risk and cost involved in Information Technology investment and increase the enterprise efficiency, products quality and provide capacity in spawning new related business

Key words: Information technology, enterprise design factors, competitive advantage of information technology, manufacturing industry.