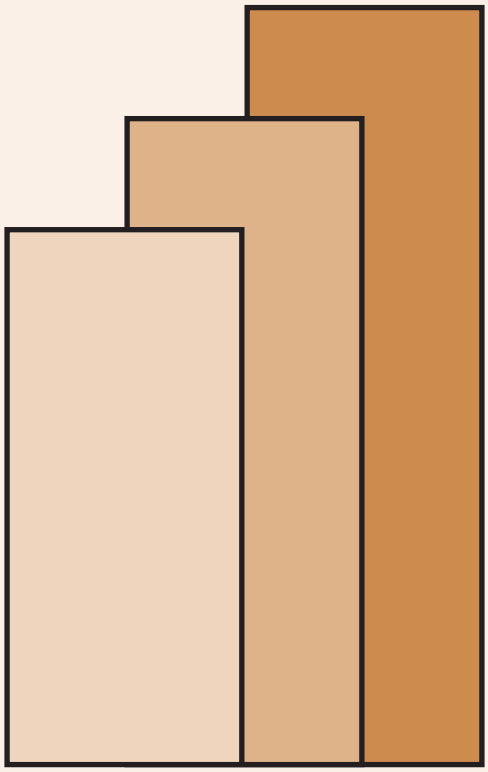
Philippine Institute for Development Studies
Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas

Achieving Innovation without Formal R&D: Philippine Case Study of Garment Firms

Fatima Lourdes E. del Prado and Maureen Ane D. Rosellon

DISCUSSION PAPER SERIES NO. 2017-09



March 2017

For comments, suggestions or further inquiries please contact:
The Research Information Staff, Philippine Institute for Development Studies
18th Floor, Three Cyberpod Centris – North Tower, EDSA corner Quezon Avenue, 1100 Quezon City, Philippines
Tel Numbers: (63-2) 3721291 and 3721292; E-mail: publications@mail.pids.gov.ph
Or visit our website at http://www.pids.gov.ph

Achieving Innovation Without Formal R&D: Philippine Case study of Garment Firms[1]

Fatima Lourdes del Prado and Maureen Ane D. Rosellon[2]

Abstract

It is widely acknowledged that technological innovations that can come from research and development (R&D) are crucial to industry competitiveness and sustained economic growth. Although R&D remains to be the central focus of policymaking and research, not all firms can afford and do R&D activities. Non-R&D innovation, which is a common economic phenomenon, is often ignored in the policy research arena. Using three case studies, this paper attempts to address this gap. It describes how firms in low-technology sector adapt to fast-changing industry needs and respond to market demands, and generate products and services at a lower cost and within shorter cycle-times without the aid of a traditional R&D program. Findings indicate product or process upgrading even without the presence of a formal R&D unit is possible. To be able to carry out upgrading/innovation activities, it is necessary to hire the appropriate personnel that will undertake specific tasks in order to execute the product specifications required by the clients. Machinery/technology acquisition was also found to be indispensable, as it not only allows the firms to produce the required product but it also makes production cost efficient. Finally, the business strategy or decision of the owner/manager of the firm also plays an important role on the decision to innovate.

Keywords: innovation, non-R&D innovation, non-R&D activities, garments

[1] This case study was written as part of the ERIA and JETRO collaborative research project on "Industrial development along the global supply chain: organizational evidences from Southeast Asia." This is a slightly modified version of the paper compiled in the project report in January 2016.

[2] Ms. del Prado is former Senior Research Specialist and Ms. Rosellon is Supervising Research Specialist at the Philippine Institute for Development Studies.

1. INTRODUCTION

Endogenous growth theory dictates that technological innovations that can come about from research and development (R&D) are important to sustain economic growth. The knowledge created by firms in the process of improving their products and operations, has spillover effects that can raise the productivity of other firms and even other sectors (Gonzales, et al, 2010). R&D serves critical industrial and economic purposes that should make it a strategic priority for virtually every firm and country around the world.

In reality however, not all firms do and can afford to do R&D and not all countries are into R&D race. Although R&D has been the central focus of policymaking and academic research, non-R&D innovation is not uncommon. New indicators reveal that firms that do not have formal R&D unit are not remarkably different from R&D performers in terms of their economic performance or mortality (Arundel et al., 2008; Kirner et al., 2009; Som et al., 2010; Rammer et al., 2009; Som 2012). Firms may introduce new products in the market without engaging in formal R&D. There is a growing recognition that innovation is not just about R&D and that firms innovate through a wide range of activities. Besides, a substantial part of learning and innovation may not always take the form of formal R&D programs and other systematic technological efforts. Yet majority of studies on innovation concentrate almost entirely on R&D, often ignoring the other ways through which firms innovate. Considering that R&D is traditionally the domain of developed countries, neglecting the plight of non-R&D performers in policy study arena may have huge implications for firms in developing economies.

Using two industry case studies, this paper attempts this address this gap and explores the other methods that firms employ to innovate. Under a broad of view of innovation, the paper describes how firms in low-technology sector adapt to fast changing industry needs and respond to market demands, and generate products and services at a lower cost and within shorter cycle-times without the aid of a traditional R&D program. From these experiences, the paper will outline some of the commonalities and draw some possible insights for policy. However, before going into their respective business history and innovation narratives, it would be appropriate to have an idea at this point of the Philippine situation and the state of R&D in the country. For the purpose of this study, formal R&D refers to the presence of R&D department in a particular firm, with a systematic process in undertaking product, process or any form of innovation or technological upgrading.

2. OVERVIEW OF R&D IN THE PHILIPPINES

The rationale for government support for R&D is well established and despite the known benefits, the Philippines has long suffered from underinvestment in R&D compared with its neighbors in the region. Except during the Marcos and Ramos administrations, the Philippine government has spent less than 2% of the Gross National Product (GNP) on R&D. This is in stark contrast with Japan and Korea, which have spent over 5% of their GNP on R&D since the 1940s.[3]

Cororaton (2003) took note of the national and sectoral gaps in terms of expenditure, budget, manpower, and inefficiency in institutional arrangement of R&D in the Philippines. In 1999, the estimated gap in R&D expenditure was placed at 0.5778 percent of the GNP at the national level, and significant underinvestment was likewise observed in the R&D for agriculture, fisheries and private manufacturing sector. There were very little resources allocated to perform research activities and properly maintain physical facilities.

A far greater problem was the issue of R&D manpower. The estimated gap in the R&D manpower in 1999 was 197 scientists and engineers per million population. In some sectors like agriculture, fisheries and manufacturing, the low level of scientific qualification was as much of a problem as the shortage of R&D personnel. The majority of R&D staff had only basic college degrees and a very tiny percentage were Ph.D. holders in engineering and technology. Cororaton (2003) maintained that while the Philippine educational system produces the biggest numbers of college graduates compared to other ASEAN countries, science and engineering graduates constitute a very small minority. This is perhaps why the country is widely perceived to have a weak research culture (RTI 2014).

Although the glut of nontechnical graduates persists, a recent assessment from a USAID-commissioned study in 2014[4] provides some encouraging results. The study finds that the quality of science, technology, engineering, and mathematics –(STEM-) related training in the Philippines is at already par with global standards and the supply of STEM graduates have increased continuously, and have even exceeded local demands.

---

[3] Nolasco, L. 'Advancing R&D in the Philippines', *The View from Taft*. Business World Online. 28 May 2014. http://www.bworldonline.com/content.php?section=Opinion&title=advancing-r&38d-in-the-philippines&id=88157

[4] USAID-Philippines Science, Technology, Research and Innovation Development (STRIDE) Program Assessment

This finding seems to corroborate and relate well with the recent figures from the Department of Science and Technology (DOST). Data show a steady increase in the total number of R&D personnel from 9,325 in 2002, to 20,215 in 2012. Although caveat should be applied in interpreting the 2013 figures due to some methodological differences, the general R&D indicators as shown in Table 1 represent significant improvements from decades past.

Table 1: Research and Development (R&D) indicators, Philippines

Indicator	2002	2003	2005	2007	2009	2011	2013
Total R&D Personnel (Headcount)	9,325	13,488	14,087	14,649	16,673	20,215	36,517
No. of Researchers (Headcount)	7,203	8,866	10,690	11,490	13,091	15,394	26,495
No. of R&D Personnel per Million Population	116	165	165	165	181	211	374
No of Researchers per Million Population	90	108	125	130	142	161	271
Total R&D Expenditures (current prices/in million pesos)	5,770	5,910	6,362	7,556	8,779	13,143	14,787
R&D Expenditures as % of GDP	0.15	0.14	0.12	0.11	0.11	0.14	0.14
% share of public to total RDE	28%	27%	36%	35%	36%	39%	57%
% share of public to total RDE	72%	73%	64%	65%	64%	61%	43%
RDE per R&D Personnel (current prices, in thousand pesos)	619	438	449	516	527	650	405
RDE per R&D Personnel (current prices, in USD)	13,170	9,319	9,553	10,979	11,213	13,830	8,617
RDE per Researcher (current prices, in thousand pesos)	801	667	592	658	671	854	558
RDE per Researcher (current prices, in USD)	17,043	14,191	12,596	14,000	14,277	18,170	11,872

Notes: Public RDE includes expenditures of government agencies and state universities and colleges; Private RDE includes expenditures of private industries, private universities and private non-private institutions.
Source: Compendium of Science and Technology Statistics, 2013, DOST

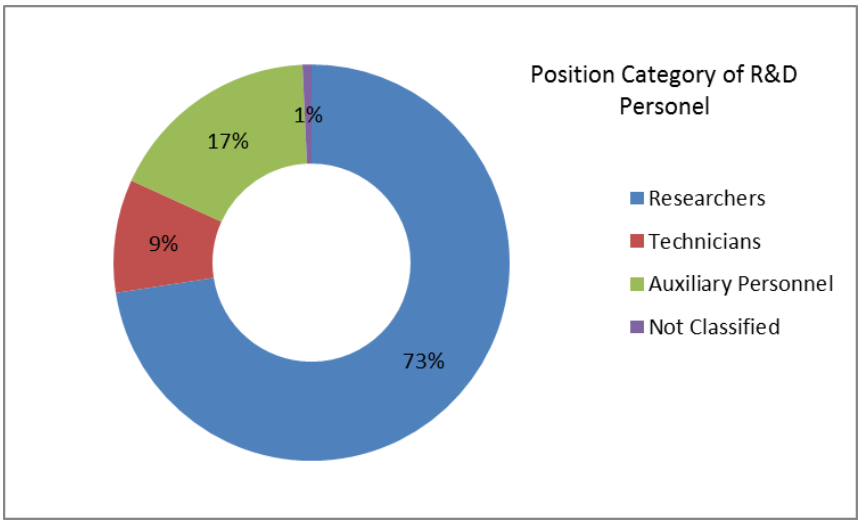
In terms of headcount, R&D personnel from the public sector constitute a huge bulk of R&D workforce (Table 2). For higher educational institutions (HEIs) as science and technology entities, more R&D personnel came from public HEIs since they receive annual subsidies from the National Treasury.

Table 2: R&D personnel by sector

Sector of Performance	R&D Personnel (Headcount)						
	2002	2003	2005	2007	2009	2011	2013
All Sectors	9,325	13,488	14,087	14,649	16,673	20,215	36,517
Government*	3,054	3,425	3,539	3,198	3,063	3,082	3,774
Higher Education*	4,093	4,423	5,262	6,103	7,185	8,285	10,189
a. Public HEIs	3,134	3,399	3,631	4,110	5,493	6,311	7,647
b. Private HEIs	959	1,024	1,631	1,993	1,693	1,974	2,542
Private Non-Profit*	242	293	180	199	387	125	227
Private Industry**	1,936	5,347	5,106	5,150	6,038	8,723	22,327

Sources: Compendium of Science and Technology Statistics, 2013, DOST

Figure 1: Position category of R&D personnel



Source: Compendium of Science and Technology Statistics, 2013, DOST

Table 3: Number of researchers by sector of performance

Sector of Performance	Number of Researchers (Headcount)						
	2002	2003	2005	2007	2009	2011	2013
All Sectors	**7,203**	**8,866**	**10,690**	**11,490**	**13,091**	**15,394**	**24,577**
Government	2,339	2,557	2,797	2,480	2,318	2,387	2,965
Higher Education	3,513	3,712	4,591	5,622	6,676	7,472	8,222
Public HEIs	2,693	2,856	3,185	3,691	5,111	5,592	7,144
Private HEIs	820	856	1,406	1,931	1,565	1,880	1,078
Private Non-Profit	131	169	112	171	325	85	179
Private Industry*	1,220	2,428	3,190	3,217	3,772	5,450	13,211

Source: Compendium of Science and Technology Statistics, 2013, DOST

Table 4: Profile of researchers in 2013 by sector of performance

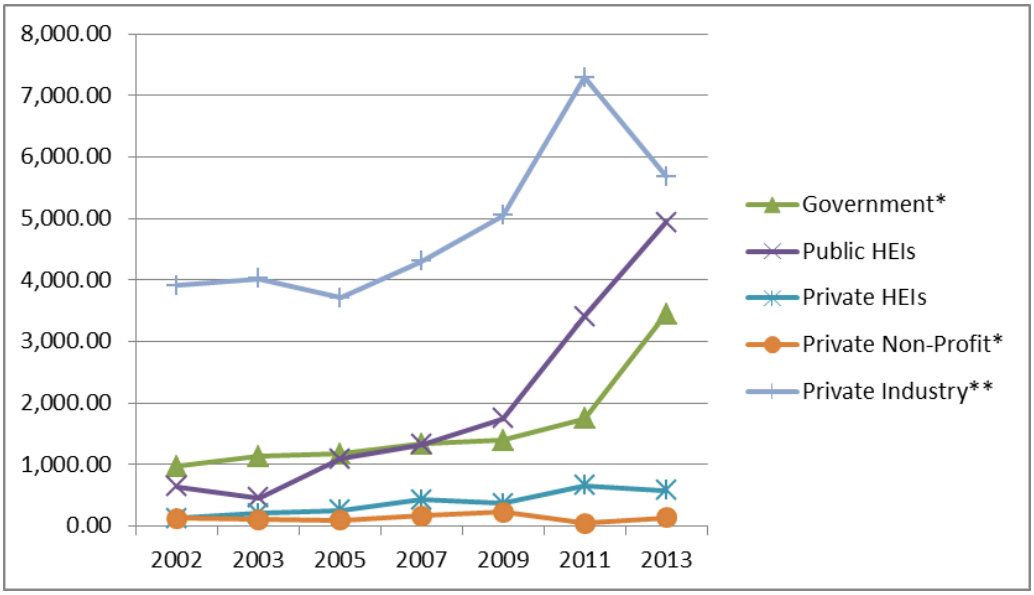
Classification	Government	Higher Education		Private Non-Profit	Private Industry
		Public	Private		
Total Researchers	**2,965**	**7,144**	**2,364**	**179**	**13,211**
By Sex					
Male	1,335	3,070	1,078	70	7,399
Female	1,630	4,074	1,286	109	5,812
By field of Research Work					n.a
Natural Sciences	512	1,723	407	58	
Eng'g & Technology	423	850	485	9	
Agricultural Sciences	1,485	1,408	17	24	
Medical Sciences	359	599	220	18	
Social Sciences	156	585	667	68	
Humanities	30	774	192	2	
Not Classified		1,205	376		

Note: Data for Private Industry Sector are not available in all disaggregation; hence national total cannot be generated
Source: Compendium of Science and Technology Statistics, 2013, DOST

As indicated in Figure 1 and Tables 3 and 4, more than 70 percent of the R&D workforce are public sector researchers in the area of agricultural sciences, natural sciences, engineering and technology, and the medical field.

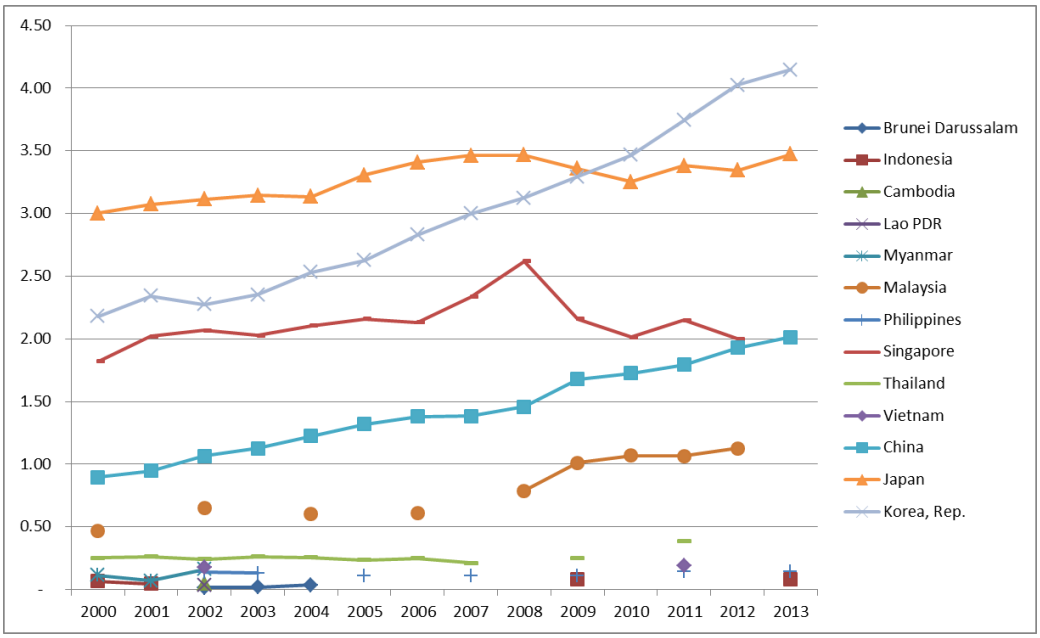
While it may true that a substantial portion of the R&D manpower are in the public sector, data on R&D expenditure show that R&D efforts in the country are largely private sector led (Figure 2). Overall, 64-70% of R&D investments were private funds and the rest came from the public sector. Government investments in R&D however, which have remained at about 0.1% of the GDP since 2002 (Table 1 and Figure 3) paled in comparison with its other neighbors in ASEAN and almost irrelevant when placed side by side with Japan and Korea, whose budgetary allocation for R&D is about 3.4 percent of their respective GDPs (Figure 3).

Figure 2. National R&D expenditures by sector of performance



Source: Compendium of Science and Technology Statistics, 2013, DOST

Figure 3. R&D expenditure as % of GDP, 2000-2013



Source: Compendium of Science and Technology Statistics, 2013, DOST

3. CASE STUDY OF THREE GARMENT FIRMS

R&D is known to be valuable to technological innovation, and critical to the absorptive capacity and competitiveness at the firm and industry level (Huang et al, 2011). However, the innovation literature suggests that there are methods, aside from R&D, that firms may use to undertake innovative activities. Arundel et al (2008) summarizes them into four core methods to innovate without performing formal R&D, namely: technology adoption; minor modifications or incremental changes to products and processes (including use of engineering knowledge); imitation including reverse engineering; and combining existing knowledge in new ways.[5]

- Technology adoption refers to acquisition of innovative products and process from sources outside of the firm, but which requires little or no further work. Acquisition of new machinery and equipment and of new ideas for organizational innovations from other firms are some of the most common innovation activities across firms.

[5] The brief description on the four methods lifts from Arundel et al (2008) which cited several literatures on the topic.

- Minor modifications or incremental changes may refer to products, processes or technologies that have been developed by the firm in the past. An example is incremental innovations in the production process to increase efficiency and reduce costs. A related concept is 'learning by doing', which implies that continuous practice and minor innovations may lead to incremental productivity improvements in the firm. This method would require creative effort from the firm's employees and developing in-house innovative capabilities.
- Imitation including reverse engineering does not require R&D. Replicating products or processes that are already available is common in less developed countries or for innovations that are not patentable. Like the previous method, this would require creative effort from the firm's employees and developing in-house innovative capabilities.
- Combining existing knowledge in new ways can be used to create new product, for instance in industrial design and engineering projects. Under this method, tacit knowledge, engineering/technical skills, and cumulative learning processes are some of the important elements.

For low-medium technology firms/sectors and small enterprises, the innovation processes are typically less formal and more inclined to modification and incremental change, design and process optimization, and practical application of tacit knowledge (Arundel et al, 2000). While for firms with R&D units/departments, the R&D activities are explicit and easily identified. However, use of the abovementioned innovation methods is not limited to small enterprises or low-medium technology firms/sectors; high technology firms and firms with formal R&D may also adopt them.

Within this context, interviews of three (3) garments firms in the Philippines were conducted for this case study to determine how firms without formal R&D undertake technological and product changes. Firms were asked basic information about their company and a brief history. A key objective in the interview was to collect information on the firm's innovation or upgrading process – what type of innovation (e.g. product, process, etc.), what and who initiates it, which resources are involved (internal, external), the path and mechanisms undertaken towards upgrading, and obstacles to innovation and measures that were undertaken to address them.

3.1. Profile of Firms

Table 5: Basic profile of firms interviewed

	BW	TL	HT
Product	basic shirts	men's tops	children's apparel
Year established	1966	1994	2013
Employment	300	318	150
Ownership	100% Filipino	Filipino (99.985%), Chinese, Mexican	Filipino-Taiwanese
Sales	95% exports	100% exports	100% exports
Destination of exports	UK, US	US, EU, Asia (Hong Kong, Japan, Korea, China)	US, France, Hong Kong, China

Source: Firm interviews.

Table 5 presents basic information on the three firms that were interviewed. BW and TL belong to the large enterprise category in terms of employment; while HT is medium in size based on the same criteria. The firms are primarily exporters and all three have the US and Europe as a common destination for products. The firms highly differ in age: BW is 50 years in business, TL is 22 years, and HT is 3 years. All three firms have Filipino ownership, except that BW is fully locally owned.

3.2. Discussion on case study firms

3.2.1 *BW interview results*

Brief background

Company A is a manufacturer of basic wear garments owned by a long-time Indian immigrant to the Philippines. It has been in the business since 1966, initially as a manufacturer of baby garments sold domestically and mainly for major shopping malls in Metro Manila, Cebu and Davao in particular, Zamboanga. However, changing business demands and varying trading environment have caused the company to explore overseas markets and started manufacturing

basic shirts in small volume for exports in 1980. It also admitted to changing business names and registration, presumably to keep and avail of government incentives.

In 2004, it stopped selling locally and concentrated on exporting of basic shirts, which was thought to be a practical business decision since raw materials were virtually none existent and innovation requirements were minimal. The interviewee also cited as a strong deterrent, the lack of government support in that area. Unlike fashion garments, which require constant supply of fabric, varying designs and accessories, basic garments have practically no need for product development.

Sources of materials

BW specializes in T-shirts, polos, blouses and school uniforms mostly sold in Europe (95-97% of sales) and in some parts of the United States. All orders are under OEM[6] basis and prices generally range from USD 1- USD3, depending on the size and material used.

BW has a head office in the Makati Central Business District and a 12,000sqm factory in the municipality of Santa Maria in Bulacan province, which is about 24 kilometers from Metro Manila. It makes its own fabric, but in some cases, it sources its fabrics from local vendors in Manila. The company imports its thread or yarn (i.e., polyester and cotton) from Taiwan and Vietnam.

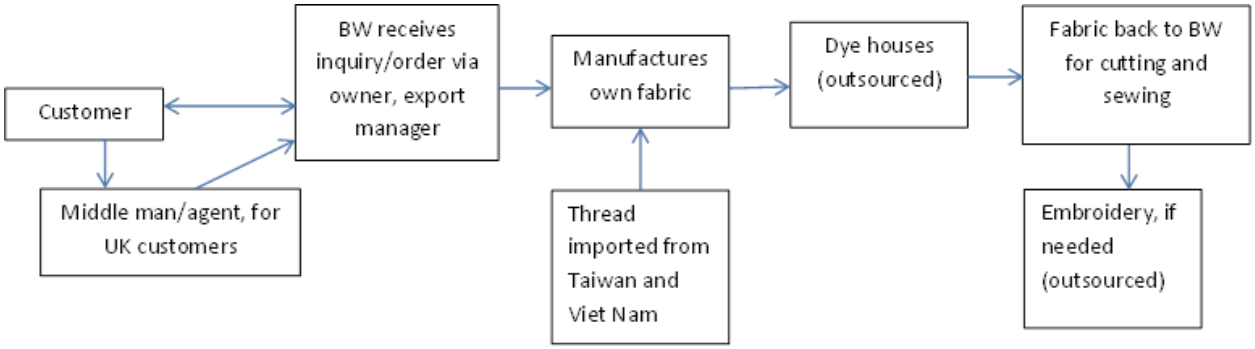
Details of production and upgrading activities

A middleman or an agent, based in the UK looks and initially deals with a potential customer. Production is mobilized when a customer, places an order and specifies the color or shade, cut, pattern and embroidery of the shirts. Then the owner, export manager and pattern maker are involved in executing the specifications and a sample is produced. Sample designs are usually finished in 21 days. Once the sample passes customer's satisfaction, the actual production begins and the firm begins purchasing materials. It is also not uncommon for customers to visit the plan and observe actual operations. According to sources, the company launch up to 200 models a year.

[6] Original Equipment Manufacturer (OEM). An OEM is a company that manufactures a part/component which is used in another company's final product.

While printing, knitting and sewing are mostly done in-house, the company retains a local dye house where it can outsource dyeing services especially in cases of bulk orders. Embroidery is also subcontracted to local craft workers. And to ensure Quality Control, four inspectors make the team which examines all finished products before packing and shipping. The company requires a minimum order of 10,000 pieces per model and delivery is within 120 days. Figure 4 illustrates the basic production processes of the company.

Figure 4: BW production activities



In terms of cost structure, about 40 percent of company expenditure goes to the purchase of raw materials, while 40% are expended on labor in the form of salaries and employee benefits. Although the company can roll out 180,000 pieces every month, its average monthly output is only 126,000 pieces, which is equivalent to a capacity utilization rate of about 70%. Its annual earnings can range from US$2.5 Million - US$5 Million.

Despite the company's seeming reluctance to accept the challenge of innovation, the company still undergoes Workplace Conditions Assessment (WCA), which is renewed every year. WCA covers Health and Safety – machines, chemical and hazardous material, and Environment – environmental management systems, waste and air emissions. Technological upgrading on the other hand, is limited to improvement of machinery (e.g. sewing machines) and lighting air circulation system to save on electricity. Suppliers of new machines send technicians to the plant to orient and train the staff how to operate the new machines.

In terms of workers' training and development, sewers are trained in-house with some old, regular employees being requested to train the new recruits. The interviewee noted the difficulty of hiring skilled workers and the lack of available, government-sponsored trainings on sewing, silk-screening and other skills related to garments and textile manufacturing. He is nonetheless, greatly motivated by recent developments to switch to local markets as exports are marginally getting more competitive.

3.2.2 *TL interview results*

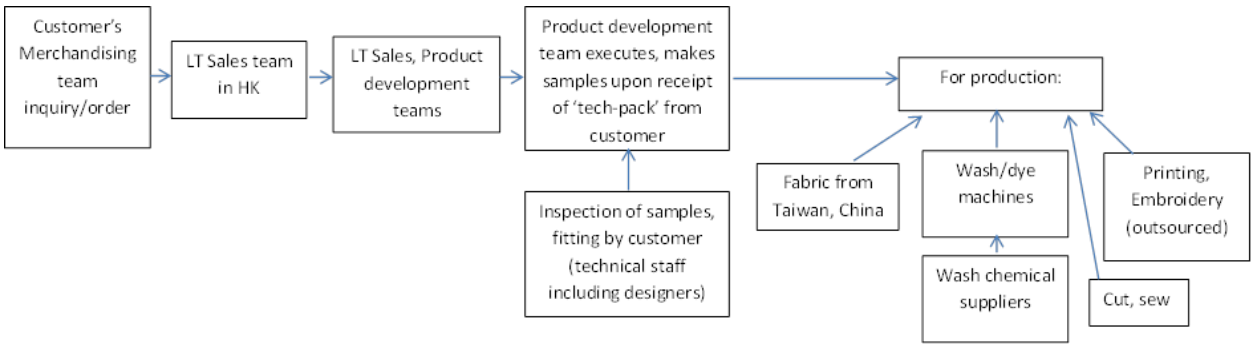
Brief background

In 1994, TL started as a 'back-end', cut-to-make manufacturing company. Customers provided samples which they replicate and reproduce. Their products were basic styles during that time. But after a while, the products were not competitive anymore in terms of pricing. After over a decade, in 2009, TL started 'end-to-end' manufacturing, i.e., from sales (orders) to shipment. TL, as a business unit in a group of companies, depended on the product development center located in China in the past years. But due to the increasing operating cost in China, the product development center migrated to the Philippines at TL. The products that TL produced since then had complicated make (compared to basic) or what can be classified as fashion apparel. And with the relocation of the product development center, TL now develops wash, embroidery and print, through collaboration with suppliers, based on the client's requirements. The company does not develop designs; the clients create the design and TL executes based on the specification.

Details of production and upgrading activities

Figure 5 presents a general picture of TL's production process. The group of companies holds a sales office in Hong Kong, and this is where the customers, through their merchandising team, place their inquiries/orders for TL's products. The Hong Kong sales team would the contact TL Philippines' sales team and product development center as regards the customer's inquiry/order. While in general, communications are done by phone or email, customers together with some of the Hong Kong sales team also visit the TL office in the Philippines to discuss the transaction.

Figure 5: TL production activities



Once the transaction is settled, TL's product development team receives a 'technical package' from the customer which contains information on the style, construction, artwork, wash and other specifications on the product/garment. TL's product development center then makes samples based on the specifications. The customers, through their technical staff and designers, inspect the samples produced. In some instances, the customers bring models to the Philippines to check the fit of the samples.

TL' product development team is composed of technical staff, for example, technicians that interpret the design specifications of the clients; pattern makers; and markers. The interviewee expressed having difficulty in hiring locals that have the required skills; hence, the company hires foreign personnel.

Production starts as the samples are approved. Fabric material and accessories that are used for the garments are imported from China and Taiwan. Such raw materials, with the quality that they require especially in accessories, are not available in the Philippines; hence they are imported. As for the wash required for the garment, TL procured wash machines but it collaborates with a supplier who develops the wash chemicals. TL's technical staff are sent to a supplier (e.g. to its lab in Turkey) to collaborate on the wash that is required by the customer. Printing and embroidery work is outsourced. Likewise, there is close collaboration with suppliers to be able to successfully execute the specifications of the client. The final work, that is cutting and sewing, is done by TL.

The interviewee emphasized how they had strategized to keep continuing and strengthening their partnership with suppliers that are all doing well in the industry and are accredited by the

client. To ensure quality, the clients, as well as TL on its own capacity, occasionally conduct audits/plant visits in the suppliers.

Over the years, TL upgraded machines of high technology as it shifted from back-end to end-to-end manufacturing. It also invested in new machines, for example a recently procured embroidery machine, that produced their samples efficiently. TL does not hold an ISO certificate because it is not required by the clients, but it has the important/relevant certificates needed for garments manufacturing and for exporting to other countries: e.g. Worldwide Responsible Apparel Production (WRAP), Global Security Verification Program (GSVP), and Customs-Trade Partnership against Terrorism (C-TPAT).

Given obstacles such as high cost of production (especially electricity) and increasing competitiveness in the market, and at the same time opportunities from reduced trade barriers (e.g. FTAs, GSP), TL took advantage of the opportunities in GSP and started manufacturing bags which get preferential tariff rates under the GSP.

3.2.3 *HT interview results*

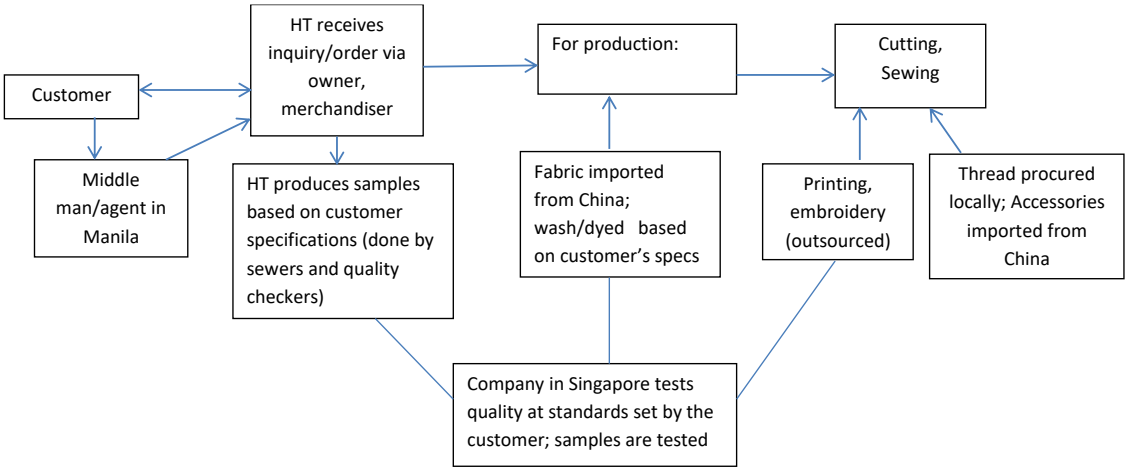
Brief background

HT was established in 2013, a spin-off from another company that produces garments but was slowly terminating its manufacturing component to focus on trading. In 2015, the lateral transfer to HT was finalized. HT manufactures children's garments to specialty stores in the US, France, Hong Kong and China.

Details of production and upgrading activities

Figure 6 presents the production process in HT. There are customers that contact HT directly (owner and merchandiser), and there is one customer that communicates with HT through an agent in Manila. About 90 percent of communications with customers are done by email correspondences, and about 10 percent of the time, the customers visit the HT office to discuss costing and styles.

Figure 6: HT production activities



Based on the specifications of the customers, HT produces counter-samples. To satisfy requirements of one customer, DS, the samples are sent to Singapore for standards and quality testing (testing company is accredited by the customer). As the garments they manufacture are for children, the raw materials used should be safe for children hence undergo lead test, saliva, test, pull test (for buttons), among others. HT pays for such tests.

HT has a sample room, where samples for customers are made. The room has eleven (11) sewers doing different sewing operations, and one quality checker, one who understands specs of garments.

Once the make of the sample is approved and tests completed, HT starts production and procures fabric from a fabric mill in China. This fabric mill and its wash suppliers are nominated by HT's customer DS. In addition, to satisfy customer DS' requirement, the fabric mill sends samples of the fabric to HT which then sends the samples to Singapore for testing.

Printing and embroidery are outsourced. The suppliers are accredited by HT's customers, who sometimes visit the supplier's office for inspection. For HT's customer DS, samples of print and embroidered sections of the garment are sent to Singapore for tests. In sum, in every stage of production, the outcome should be tested in Singapore and approved by DS, and the suppliers should be accredited by them (DS).

The final stage of the production line, sewing (after cutting), is done at the HT. Over the years, HT upgraded its sewing machines from manually pedaled to motorized, high-speed, and automated thread-cutting machines. They have also converted to energy-saving motors for the sewing machines (offered by their machine supplier).

The thread that is used for sewing is purchased locally, while accessories needed for the garments are imported from China (buy from local during emergency/urgent need). The interviewee shared that there are accessories available locally, but since HT is located in a special economic zone, they enjoy duty-free importation of raw materials and value-added tax-free.

HT trains its sewers and other production personnel in-house. They do this because it is difficult to look for qualified technical/skilled people. The interviewee also shared that they need more sewers but raised concern about the difficulty of hiring more sewers because of the big demand in their area, where a lot of garments factories are located. The interviewee was also apprehensive about sending personnel to government-offered trainings (e.g. TESDA) as most of them leave after training.

HT's customer DS provides training as perhaps part of quality control. DS provides the training materials and resource persons. Their personnel have received training such as on reporting skills and efficiency in production, among others. This somehow served as their ISO certification, since ISO is not required as long as the suppliers are accredited.

As of the moment, HT has no plans to expand yet (it is fairly new), or try designing for DS for its other store outlets. DS has accepted designs from its suppliers for some of its store outlets, but HT does not have the personnel to do it and would like to focus on the current production for DS' specialty stores.

3.3. Case comparisons

All three (3) firms are OEM. The customers define the product style, while the firms execute accordingly. According to the garments industry association, this situation is common to majority of garments exporting companies in the Philippines. The three firms have also not tried producing their own brand, and do not plan to do so in the future. But the firms similarly

have upgraded their production processes to keep up with the product style and standards of customers.

The case study firms operate similarly in terms of connecting with customers. The three firms, while having direct contact with customers, have agents in dealing with as well as searching for new customers. BW has an agent in UK; HT has an agent in Manila; and TL has sales team in Hong Kong as part of the group of companies TL belongs to. Though perhaps, TL differs in a way that its agent is focused on TL and its subsidiaries, unlike BW and HT wherein the agents may have other clients that they provide services.

All three firms are also able to collaborate with their customers as well as their suppliers. Though the types of product they manufacture are customer-driven, the three firms are able to provide/share their ideas into developing the product. On the other hand, because parts of the production process are outsourced (except sewing), the firms dealt with suppliers/providers of services. In all three firms, collaboration with the suppliers is important in view of satisfying the requirements/specifications of their customers.

The three firms also expressed difficulty in getting skilled sewers and technical people in their locality: there is scarcity in supply and training is not available. There is also lack of raw materials locally – from fabric (except for BW who produces its own) to accessories that are used in fashion apparel.

As far as differences is concerned, the internal group that is involved in product 'development' is basically composed of the pattern maker and sewer in BW and HT, but TL has a product development center with a team that is composed of technical people aside from pattern makers and sewers. As a subsidiary, TL also has support from the group of companies in terms of technology transfer, unlike BW and HT which are not affiliated with any bigger company. In this case, it is possible that this support or resource that made TL differ from the other two firms as it seems to be more motivated to innovate. BW manufactures basic clothing, hence there is relatively little room for innovative ideas in products compared to fashion apparel. And HT, perhaps because it is relatively new and because of the type of business relationship it has with its big customer, seems to be highly dependent on customer demand/requirements.

Comparing TL and HT, both produce garments with complicated make (not basic), but perhaps as the bigger company and the one with a product development center/team, TL appears to be on a higher level of technological capability than HT. TL has even ventured into diversification of products by manufacturing bags, and its collaboration with suppliers is in a more complex/technical level because of the availability of technical personnel. HT, on the other hand has no plans to expand as of the moment and intends to focus on its current market.

The difference in how the business is managed or the business strategy also appears to matter. BW started manufacturing basic shirts in the 1980s and continues to produce basic products. Over the years, it could have expanded its product line into fashion apparel because it is the trend, but it did not. While the owner/manager reasoned that accessories are not available locally and making samples consumes time, his decision to not pursue fashion garments is a big factor. On the other hand, HT as a relatively new company is concentrating on serving the current clientele that they have. While TL has greater vision, that is to diversify as a means to address the increasing competition in garments products in the international market and to capitalize on opportunities given by preferential trade e.g. GSP.

4. SUMMARY AND CONCLUSION

Three firms from the garments sector in the Philippines were interviewed to have an understanding of how firms without formal R&D units achieve innovation or technological and product changes. Using information collected from the three firms, findings indicate that it is possible to undertake product or process upgrading even without the presence of a formal R&D unit. To be able to carry out upgrading/innovation activities, it is necessary to hire the appropriate personnel that will undertake specific tasks in order to execute the product specifications required by the clients. In addition, although there is no R&D unit or department, there appears to be a mechanism inside the firm in terms of product development, involving specific staff. For instance, one of the staff discusses product specifications with clients, another analyzes the specifications, and another executes the specifications to produce the product. The same procedure is followed every time an inquiry or order comes in. Another factor is the acquisition of machinery/technology that will not only allow the firms to produce the required product but will also make production cost-efficient. Moreover, the business strategy or decision of the owner/manager of the firm also plays an important role on the decision to innovate.

Findings indicate the importance of having an environment or culture of innovation in a sector/industry, and country overall. Even if the less capable firms (in terms of resources or technological competence) could not engage in formal R&D activities, the presence of opportunities for technology transfer or sharing; networking with larger enterprises; availability and dissemination of information on international trends in products, processes, technology; exposure to trade missions; and availability of trainings for skills acquisition – could expose them to an environment where improving technological capability and undertaking innovative/upgrading activities are essential to enterprise and industry growth; thereby stimulating these firms to engage in activities towards that direction, even without the presence of an R&D unit/department.

REFERENCES

Arundel, A., C. Bordoy, and M. Kanerva (2008) "Neglected Innovators: How Do Innovative Firms That Do Not Perform R&D Innovate?" Results of an analysis of the Innobarometer 2007 survey No. 215. INNO-Metrics Thematic Paper.

Gonzales, Kathrina, Mari-Len Reyes-Macasaquit, and Josef Yap (2010) "Determinants of Locating R&D Activity in the Philippines: Policy Implications." PIDS Discussion Paper No. 2010-07. Makati City, Philippines: Philippine Institute for Development Studies.

Huang, C., A Arundel, and H. Holanders (2011) "How firms innovate: R&D, non-R&D, and technology adoption." Paper presented at the DIME Final Conference, 6-8 April 2011, Maastricht.

Kirner, E., S. Kinkel, A. Jaeger (2009) "Innovation Paths and the Innovation Performance of Low-Technology Firms – An Empirical Analysis of German Industry." *Research Policy*, Vol. 38, pp. 447-458.

Rammer, C., D. Czarnitzki, and A. Spielkamp (2009) "Innovation Success of Non-R&D-Performers: Substituting Technology by Management in SMEs." *Small Business Economics*, Vol. 33, pp. 35-58.

Som, O. (2012) "Innovation without R&D. Heterogeneous Innovation Patterns of Non-R&D-Performing Firms in the German Manufacturing Industry." Springer Gabler, Wiesbaden.

Som, S., E. Kirner, and A. Jäger (2010) "Absorptive capacity of non-R&D-intensive firms in the German manufacturing industry." Paper presented at the 35th DRUID Celebration Conference 2013, Barcelona, Spain, June 17-19.