

A STUDY INTO LACK OF PRODUCT INNOVATION AND BUSINESS TECHNIQUES AT THE TRICYCLE WORKSHOP AND ITS LESSONS TO SMALL COMPANIES

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Abstract

A study was carried out at the Tricycle Workshop (TW) which was facing the problem of lack of orders and therefore stagnation of business. The objective of the study was to find out reasons for this situation and to propose possible remedial solutions. The study was conducted using the principles of the Product Innovation Process where internal and external issues related to the business of the company were investigated for information. Analysis of information obtained indicated that the bad situation of the TW had mainly been caused by the nature of the tricycles-supply system whereby users (disabled persons) are unable to buy directly because they mainly depend on sponsoring organisations. The contacts of TW with different sponsors were found to be poor. TW did not make efforts in the past to promote its name and services, which in turn would have convinced different sponsors to buy tricycles from TW. When relating this study to other small companies, it was also observed that the problem of "Lack of orders" is quite common. The reason for this is lack of technical know-how in the companies to deal with product innovation and business issues. In such circumstances it becomes difficult for a company to realise what is hitting their business (when there is a problem) and the possible solutions for the situation. In order for TW to be successful in its business, it is proposed that TW puts up a communication/promotion plan to local and foreign sponsors. However, before promotion can be effected the company should first set up internal organisation on product design and production management. In conclusion it is recommended to establish an advisory organization that will provide services to small companies in terms of Product Business Innovation Management. This will enhance company's self-sustainability, competition and general technological development.

1. INTRODUCTION

Tricycle Workshop (TW) is a small company that mainly deals with the manufacturing of tricycles for disabled people. Tricycle (Figure 1) is a good mobile machine used by persons with lower limb disabilities but with functional upper limbs to enable them to move from one location to another. TW is housed within SIDO in Vingunguti Area along Nyerere Road. It was established in 1977 and has five employees who are physically disabled but are very experienced in their trade. TW was established under the initiative of the Department of Social Welfare (DSW) with the objective of helping disabled people

both with employment and mobility aids. In the early years of the company, the Department used to bring orders to TW for tricycles on a regular basis. The workshop used to make up to 120 tricycles per year and business was running well. However, because of change in leadership, bad organisation and lack of funds this practice of the DSW declined, as a result nothing of this kind of practice takes place at the moment. Currently the workshop can hardly produce two tricycles per month because of lack of orders. There are no ideas among staff members of TW on securing orders to keep business going.

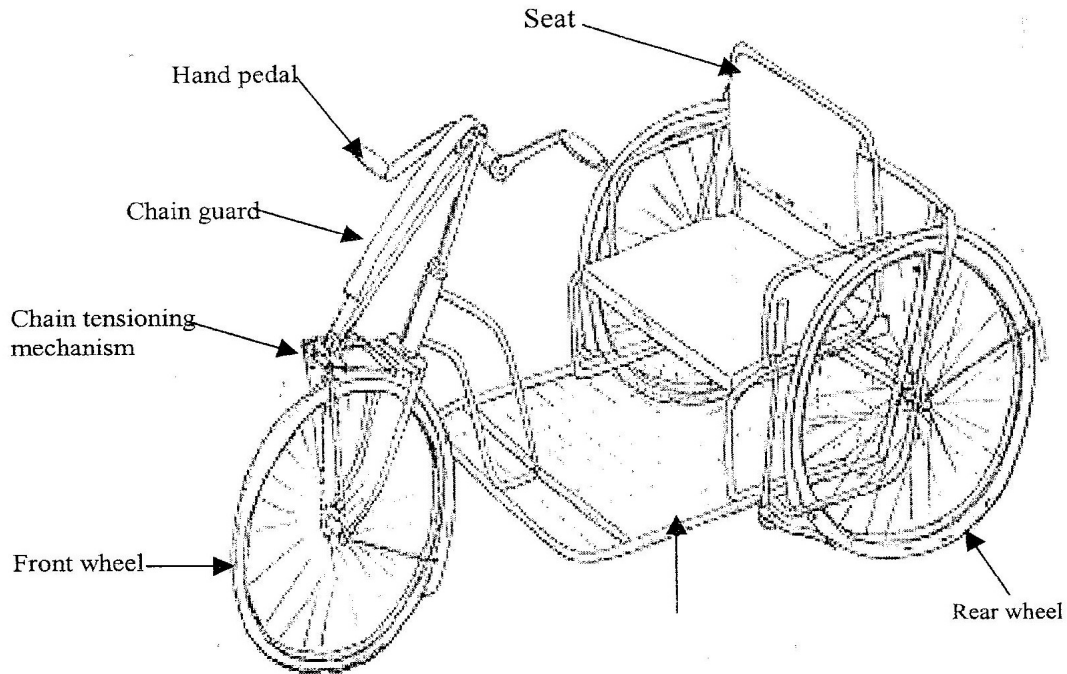


Figure 1: Sketch of the Tricycle made at TW

The present author discovered the current business situation of TW about two years ago when he visited the place. This situation was rather surprising because according to CHAWATA (*“Chama cha Walemavu Tanzania”*) there are about 1.5 million physically disabled persons countrywide [1]. Hence, the need of tricycles is therefore there. This need is also evidenced by the availability of disabled people on our streets who have no mobility aids. Consequently, it was decided to undertake a research within and outside TW so as to come up with observations and recommendations that could alleviate the situation.

2.0 APPLICATION OF PRODUCT INNOVATION PROCESS TECHNIQUES

2.1 Introduction To Product Innovation Process

The study carried out at the Tricycle Workshop was based on the principles of Product Innovation Process as advocated in

the field of Industrial Design Engineering (IDE). This process is represented in the model shown in Figure 2 [2,3]. The goal of the product innovation process is to come up with ideas that form the solution to a problem that in the first place, forms the **“incentive”** of an innovation project. The underlying idea of the innovation model in Figure 2 is to look for a way for a company to serve a certain attractive market segment better than its competitors. The outcome of the innovation process is a business plan containing the planning of actions that form the solution to the problem or incentive of the project. To come up with a consistent plan, the model is divided in a number of stages in which the solutions for the problem change from abstract solutions to concrete and planned actions. A summary of these stages is given below

2.1.1 Determination of Business Domain

The innovation process is usually started when it is thought that things are not going well with the business or will not be going well as

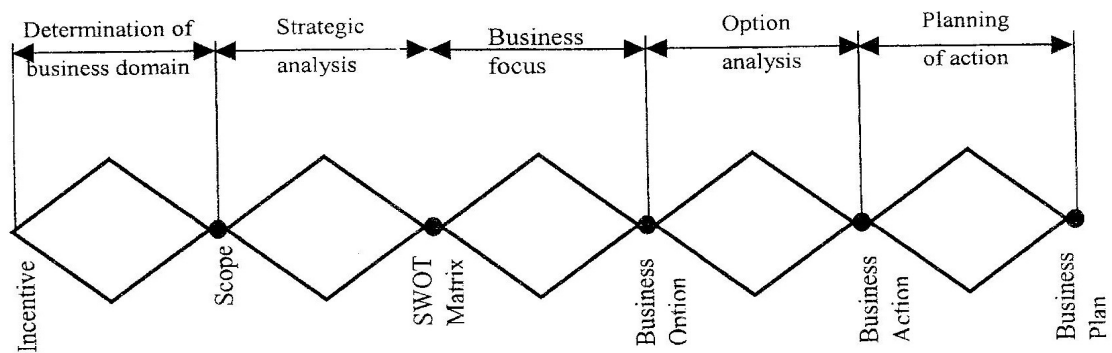


Figure 2: The innovation process (details of each stage not included) [2,3]

they should. The problem that has arose or will arise forms the incentive for the process to be undertaken as a project. Such a problem could for example be “*making losses in business*”. When the problem is clear, the business domain (i.e. wherein to look for solutions) as well as the goal (scope) of the project should be determined. A scope within a domain could for example be “*to turn losses in profit within the transport business*”.

2.1.2 Strategic Analysis

Strategic Analysis, where the company and its environment are analysed, starts with the scope. This stage mainly deals with:

- **Internal Analysis** of issues that can be influenced by the company including production (know how, technology and costs), product development, distribution, finance and management.
- **External Analysis** of trends that cannot be influenced by the company but can affect the business. This involves looking into suppliers, competitors, customers, total market demand and macro trends (political, economical, social, technological, environmental and demographical matters).

Strengths (S) and Weaknesses (W) of the company (from the Internal Analysis) and Opportunities (O) and Threats (T) against the company (from the External Analysis) are identified. The major strengths, weaknesses, opportunities and threats are used to form a SWOT matrix.

2.1.3 Business Focus

The Business Focus starts with the SWOT matrix. The aim of this stage is to get **Business Options** from the evaluation of the SWOT matrix. These options are the first rough solutions for the problem formulated in the scope. The solutions can be related to marketing, sales and product development, to mention a few. An option could for example read as “*Improve quality image of product*” or “*Improve distribution/sales*” or “*Produce other products for growing industries*”.

2.1.4 Option Analysis

In Option Analysis, the chosen business option is analysed to reach a business action. The analysis here should focus on ascertaining the market need for the chosen business option and to define the competition there is. Facilities and experience of the company to develop the chosen option also need to be looked into and ascertained.

Analysis or definition of needs in the market and facilities of the company leads to the generation and evaluation of business actions. It is possible that more than one business action need to be done to implement the business option.

2.1.5 Planning of Actions

In this last stage, the business actions are further worked out in a plan of actions. This will complete a business plan, which is a guide for carrying out the solution, which is going to fulfil the objective. After finishing and approving the business plan, the real implementation work starts.

2.2 Application of Product Innovation Process Techniques to TW

Application of the Innovation Process to a product – based business as described in section 2.1 can be a long and tedious work, requiring commitment and dedicated participation of the company management. The runnings of the Innovation Process in its entirety, therefore, suit the relatively large and financially sound companies. In such companies, furthermore, management staff members are normally well educated and knowledgeable; with assistance or coaching they can follow and participate in the process without problems.

For small companies like TW it is sufficient to carry out the process qualitatively in parts and give recommendations of business options and actions thereof. It is correct to assume that many market problems of small companies in our society originate from the ignorance or lack of knowledge of workers in dealing with internal and external environments to create awareness of trends (i.e. what is going on) in their business. In such a case it becomes difficult for a company to realise what is hitting their business (when there is a problem) and the possible solutions for the situation. For the TW, therefore, the Innovation Process was adapted by putting emphasis on the Strategic Analysis Stage (**Figure 3**) particularly on the elements of **internal** and **external analysis**. In this adaptation it was presumed that analysis of the information collected from internal and external issues of the company would lead to realising appropriate **Business Options** and to suggesting **Business Actions** thereof. **Figure 4** shows the adaptation model of the Innovation Process.

3.0 INFORMATION COLLECTION

3.1 Scope of the study

The basic problem of the Tricycle Workshop that formed the “*incentive*” for the present work was LACK OF ORDERS that has resulted in having a low production rate of tricycles. The scope or goal for the study was “*to increase orders for TW and therefore enhance their production rate and revamp business within the mobility aids domain*”.

To reach this goal, according to **Figure 4**, the main or foremost activity was to collect information from within and outside the company. It was first of all important to gather information about the TW itself, from which light could be shed on other sources of information within the supply system of tricycles.

3.2.1 Internal Information From the Tricycle Workshop

At TW, information was gathered through informal discussion with staff members and general assessment of the workshop internal environment and activities. The features and activities of TW, as found out, is summarised qualitatively as follows:

TW is a small company that mainly manufactures tricycles and can also manufacture wheelchairs for disabled persons. Other products, which are sometimes manufactured, are: hospital equipment (like folding screens and drip stands), steel furniture, garden tools, window and door grilles and gates. All products are produced on order; none of them is promoted towards potential buyers. The workshop also does some repairs to tricycles brought in by customers. The design of the tricycle (**Figure 1**) has slowly changed over the years. Once in a while the employees gather to discuss the problems that exist at that moment. These problems are normally communicated by customers to TW, and are of design or production nature. Together, the staff members think of a solution and adapt this in

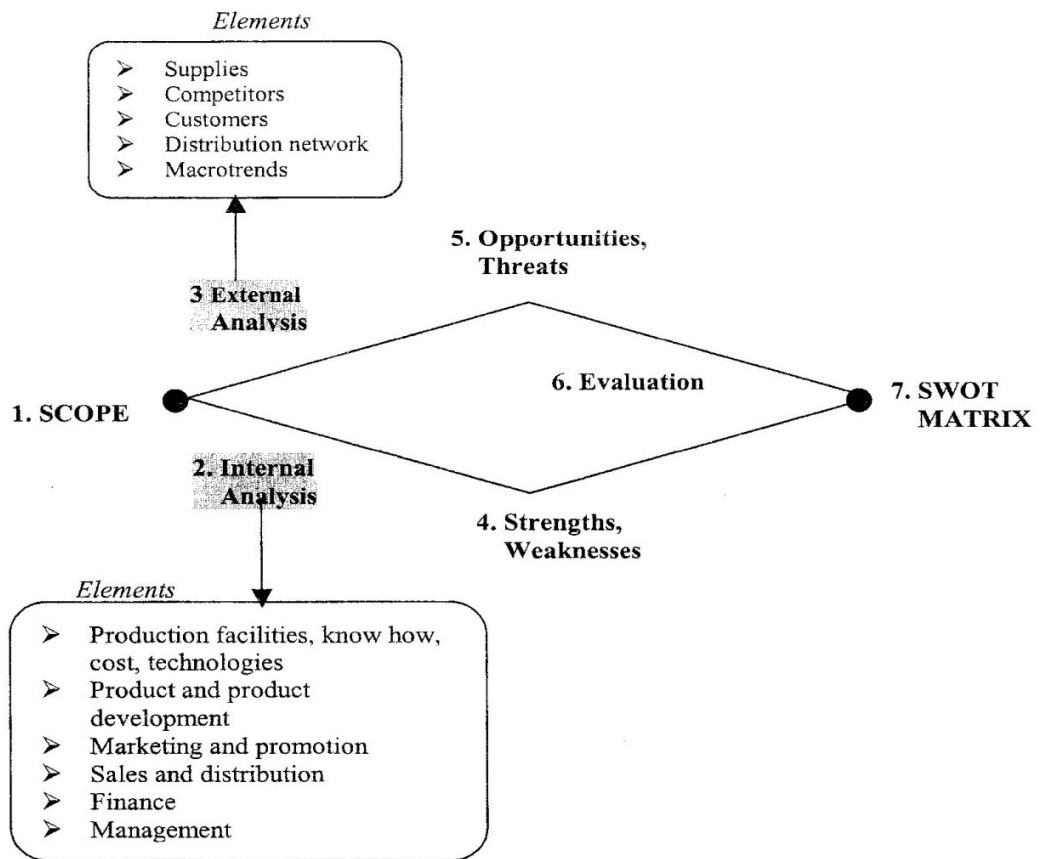


Figure 3: Strategic Analysis stage of the Product Innovation model

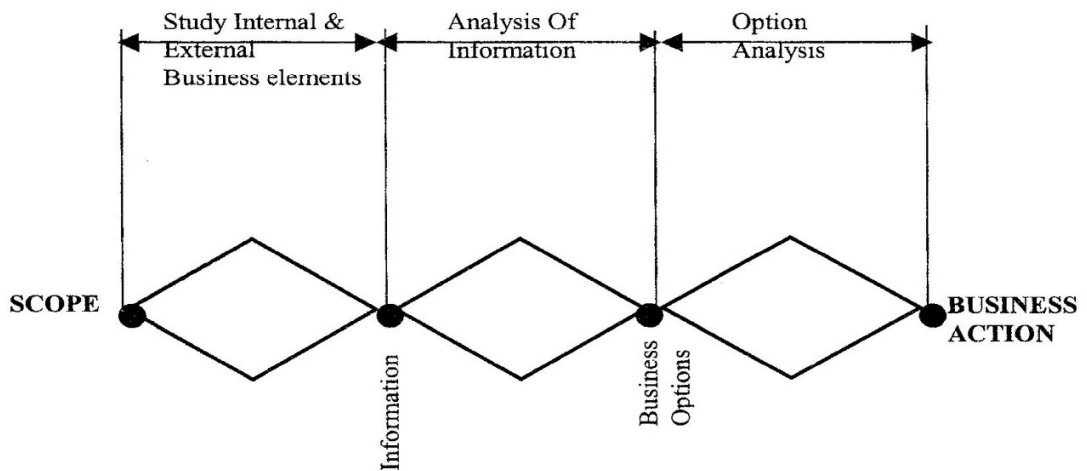


Figure 4: Product Innovation Process Model for a Small Company like TW

the design. For example the width of the tricycle has been reduced, because nowadays the doors in different houses are becoming smaller. If a customer wishes to have special adaptations, then these can be done. However, it almost never happens that a customer asks for something special, so the design is standard.

According to views of many users of tricycles, it has been gathered that TW produces good tricycles that are strong, lightweight and durable. It is also appreciated that the tricycles are produced by disabled persons who know what other disabled people need. The price of a tricycle is currently at TShs. 115,000/= and is always the same for every customer unless special parts are demanded to be added onto the standard product.

It was observed that the workshop is not well equipped with all-important types of machinery to produce components for tricycles. They have two electric welding machines, one circular sawing machine, one pipe bending machine and one drilling machine. These machines are not sufficient. For example, any machining job (requiring turning operations) has to be done outside the workshop. In addition, the shop floor of the workshop was found disorganized and untidy, it seems the workshop does not give much priority to this issue.

All five employees of the workshop got their technical education (at craftsman level) at Yombo Rehabilitation Centre before the workshop was set up. Although they have acquired high experience and skills in tricycle – manufacturing, their know-how in many technical aspects, communication, marketing and finance is low. They do not carry out any promotion of their company or business; the only known contacts they have are with the Department of Social Welfare, CHAWATA and Yombo Rehabilitation Centre.

3.3 Information From External Sources

Discussions with TW staff on the supply of tricycles to the disabled people revealed the existence of different other parties that are involved. Approaching and discussing with one party lead to knowledge of another. In this way a chain of parties was completed to provide reasonable observations. Parties were

generally approached based on suitable pre-prepared questions. Places and companies visited include Palray Limited, Jaffery Industries Limited, CHAWATA, Department of Social Welfare, Salvation Army, Yombo Rehabilitation Centre and Lion's Club. Some individual disabled people were also interviewed at CHAWATA and on streets. Information collection was aimed at finding out how these parties work or operate within the mobility aids domain and how they interact with each other and TW. A summary of the collected information is given below.

Palray Limited is a well-equipped company that mainly produces furniture for schools, offices, hospitals and household, but also produces wheelchairs and tricycles. It produces and sells 20 tricycles per month, mainly on order. It was observed that the tricycle business lacks promotion. Palray Ltd. sells tricycles to donor organizations that know the company. Orders come from the Lions and Rotary Clubs, the Department of Social Welfare and once in a while from a private donor. The company was found to have no contact with the disabled people (tricycle users), tricycles are normally delivered to donor organizations. Their tricycles look decent and professional and cost about TShs. 115,000/= each.

Like Palray Ltd, Jaffery Industries Ltd is a company that produces hospital, household, office and school furniture. They also manufacture wheelchairs and tricycles. At the time of the study, their production was about one or two tricycles per month. Promotion of tricycles is also lacking, production is effected only when an order comes in from organizations that know the company. Jaffery receives orders from the government and once in a while from a private donor. No contact exists between the company and disabled persons. The price of their tricycle was found at TShs. 110,000/=.

CHAWATA is an organization of physically disabled people. The organization was established in 1969 and has branches in all regions of the country. At the time of the study, in Dar es Salaam region there were about 450 active members while there were between 3,000 – 4,000 disabled persons in the region. Country wide, as already mentioned

in section 1.0, there were about 1.5million physically disabled persons.

An active member is one who registers with CHAWATA and pays a monthly membership fee. CHAWATA assists its active members in providing funds if available from a donor or introducing them to donors and other organizations when this is required. There are no regular money donations to CHAWATA, but some donors have been NORAD (Norwegian Association for Development), NAD (Norwegian Association for Disabled), Lions Club, Rotary Club and the Department of Social Welfare. It was learnt that CHAWATA normally buys tricycles from TW. However, when the Lions or Rotary club donates funds for tricycles, orders have to go to Palray or Jaffery that have special relationship with these Clubs.

Salvation Army is a worldwide organization that helps the disabled and ones who are less blessed in the society. Centres owned by the Salvation Army provide physically disabled persons with primary education, vocational studies, health care and religious education. The people who are looked after by Salvation Army are provided with mobility aids by the organization. For these aids, the organization looks for sponsors or uses its funds. The aids are purchased from anywhere or provided by hospitals where an individual disabled person has undergone medical examination.

The Department of Social Welfare supports the physically disabled people. In the past the Department paid 60% of the price of an aid that a disabled person needed. The other 40% was paid by the disabled person himself/herself or by another sponsor. However, at the time of the study was learnt that the Department does no longer provide this assistance because of lack of funds. The Department still does as much as it can to assist disabled people to secure sponsors. The Department introduces the disabled to sponsors (individuals and organizations) who can help. However, the study found out that only a small number (6 – 10) of disabled people were being assisted this way yearly, indicating that probably people were not aware of this service in the Department. The donation of money to CHAWATA by the Department has also ceased.

Yombo Church & Rehabilitation Centre is a vocational training centre for physically

disabled people. The centre, with a capacity of accommodating 250 students, receives students from all over the country and the government runs it. Donors of money for mobility aids for students were said to be Liliane Fonds of The Netherlands. It was learnt that this centre normally orders tricycles from TW. The employees of TW got their education at this centre, TW is therefore well known by the centre.

4.0 INFORMATION ANALYSIS

4.1 Buying Process of Tricycles

From the above investigation and the consequent information analysis **important insight** was gained on the parties involved in the tricycle-supply and their relationships. It was seen that there are four parties involved:

1. The disabled persons
2. Intermediaries
3. Tricycle producers
4. Sponsors

The inter-relationship among these parties is shown in Figure 5. Below is the description of the four parties and their inter-relationship.

4.1.1 *The Disabled Persons*

The disabled persons who form the first part include all physically disabled persons who are limited in their capability because of impairments and therefore are in need of an aid. There are different kinds of mobility aids such as tricycles and wheelchairs. These are expensive aids and can rarely be paid for by the disabled person himself or herself.

Disabled persons normally seek help from the intermediaries. Some of them go directly to sponsors, but it is more efficient to search for sponsors through intermediaries because these organizations are reliable and well known to different sponsors.

4.1.2 *Intermediaries*

Organizations within the intermediary party connect organizations of the other three parties. There are three types of intermediaries:

- Governmental: This is the Department of Social Welfare
- Non-governmental organizations: e.g. CHAWATA and Salvation Army

- Hospitals and rehabilitation centres (e.g. Yombo)

hospital and school furniture. They also manufacture tricycles and wheel chairs. Palray and Jaffery are the main competitors of TW, which is a relatively smaller company.

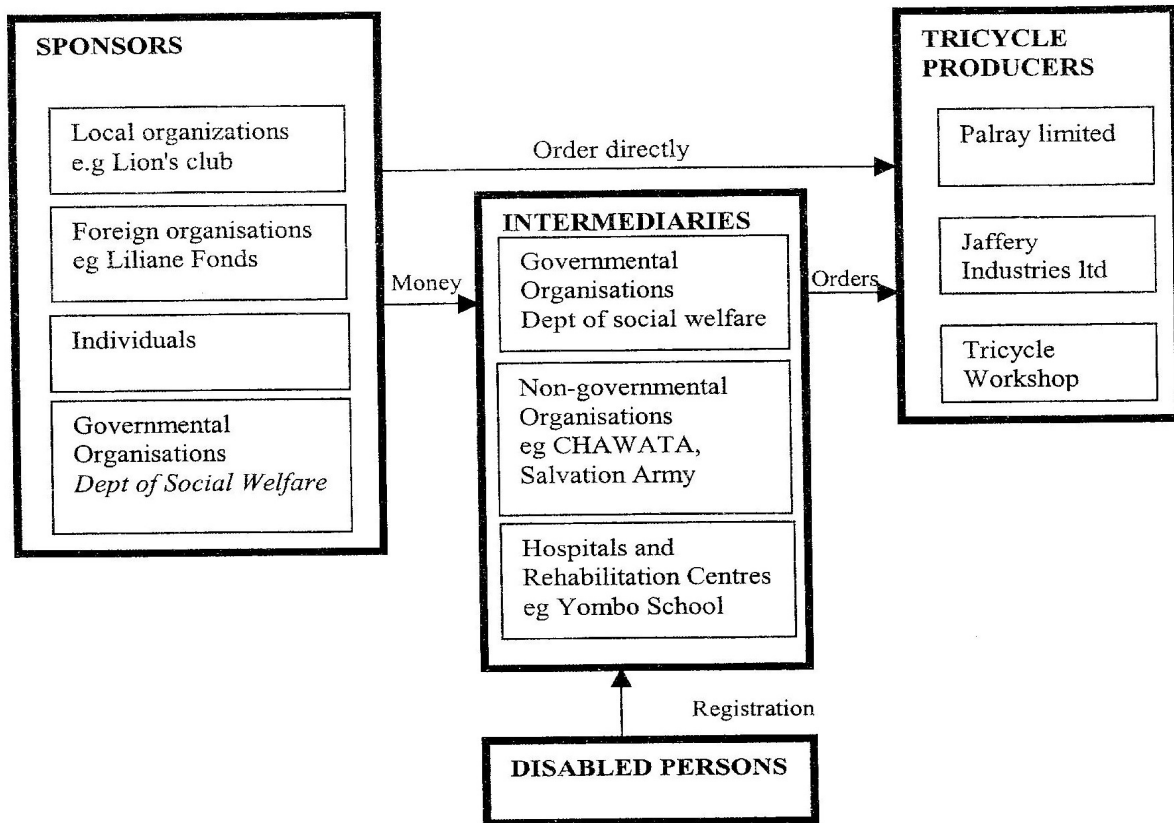


Figure 5: Parties Involved in the Buying Process of Tricycles

All these intermediaries fulfil the task of helping the disabled people by seeking financial support from sponsors who will pay for the mobility aid needed. Further, these intermediaries order or help the disabled people to order the mobility aid from a producer.

Only the Department of Social Welfare and CHAWATA contact each other regularly to discuss some issues on the disabled people. There is no contact among the other intermediaries.

4.1.3 Tricycle Producers

In Dar es Salaam Region there are three tricycle producers namely Palray Limited, Jaffery Industries Limited and TW. Palray Limited and Jaffery Industries Limited are two companies that are mainly producing office,

These three producers of tricycles are normally approached by the intermediaries or by the sponsors themselves. The producers know about the existence of their competitors but they do not care. It was observed that there is no contact between them (the tricycle producers).

4.1.4 Sponsors

At the moment of the study there were three types of sponsors namely:

- (i) Local organizations e.g. Lion's Club and Rotary Club,
- (ii) Foreign organizations e.g. The Norwegian Association for the Disabled (NAD), Norwegian Association for Development (NORAD) and Liliane Fonds of the Netherlands, and
- (iii) Individual persons.

In the past there were four, and maybe in the future there will be four again. The fourth sponsor is the Governmental Department of Social Welfare. Because of lack of funds they had stopped their donations. They may be able to donate again when funds become available.

Sponsors donate money to intermediaries and sometimes they buy mobility aids themselves and donate them directly to the users, but in most cases these sponsors have contact with the intermediaries. Some intermediaries receive money from individual persons. This can be on a regular basis or once in a while.

It was also observed that there is no contact among the different sponsor organisations.

4.2 Problems in the Tricycles Supply System

Disabled people are generally poor and therefore unable to buy mobility aids and do business directly with the manufacturers. This factor has led to a rather complicated system of supplying mobility aids (tricycles in this case) to the beneficiaries (disabled people).

Within the tricycles supply system, one problem that has been identified is that tricycle producers are not communicating directly to intermediaries or sponsors. The only contact they have is when the intermediaries or sponsors place an order. The tricycle producers do not seem to go to the intermediaries or sponsors. As a result, some intermediaries and sponsors do not know the existence of these tricycle producers. The intermediaries or sponsors always order from the same producer that they know or are related to in other ways. The Lion's and Rotary Clubs, for example, normally buy tricycles from Palray because this company is well known to them. Consequently, Palray can manage to manufacture and sell about 20 tricycles per month. TW has been very much affected by this system because it is not well known by important donors. The Department of Social Welfare and CHAWATA are the only places that know TW well but unfortunately they have no funds to sponsor the users to buy tricycles from TW.

5.0 SUGGESTED BUSINESS ACTIONS FOR TW AND REQUIREMENTS FOR THEIR IMPLEMENTATION

5.1 Business Actions

5.1.1 *Improvement of the Communication System*

The main solution to TW's business dilemma is to improve its communication or promotion system. The main product of the company is the tricycle. Therefore, TW should not wait until an intermediary or sponsor places an order, but the Workshop should communicate its existence to the intermediaries and sponsors through different channels of promotion as shown in Figure 6. This is very important because some intermediaries and sponsors do not know the existence of TW and therefore would never go to the workshop to place an order. When TW can convince intermediaries and sponsors to buy tricycles from the workshop, they will receive money to produce tricycles. These tricycles will be donated to the intermediaries who will distribute them among the disabled who are in need of mobility aids.

What the TW should further do (according to Figure 6) is to gather and consider the feedback from the customers (the disabled users). This is an activity that the competitors do not do and which will be an advantage to the TW.

5.1.2 *Internal Organization*

Before TW starts promoting itself to external parties as suggested above, they need to be internally organized first. Some internal aspects should be managed in a systematic way. These aspects include:

- (i) Product design management, and
- (ii) Production management.

In product design management, the following are recommended:

- a. All products produced by TW should be presented and documented in technical drawings so that these can be shown to people who are interested in buying any of these products. Technical drawings are also important when communicating with any kind of sponsors. This should apply not only to the main product (the tricycle),

- but also to other products (like hospital furniture, garden tools, etc).
- b. Information on competing products should be gained to hold an eye on the competitors.
 - c. There should be some thinking on future possibilities; i.e. what other products can TW produce with the available machinery.

In production management, the following are suggested:

- a. The manufacturing processes of components (e.g. of the Tricycle) should be looked into with the aim of making them simpler and cheaper to achieve and documenting them in manuals for anybody to follow.
- b. The shop floor should be organised to make it more presentable and to let the manufacturing process run as systematically as possible. There is need for TW to acquire more machines to enhance their capability and competitiveness in machining and fabrication jobs. This will make the workshop more competitive in the production of the tricycles and any other products they find appropriate for business. It can be appreciated that their involvement in the production of other

products will enhance their economic position and support the tricycle business

5.2 Requirements for the Implementation of the Suggested Business Actions

For TW to implement the suggested business actions in section 5.1.2 and get out of their current situation, it is realised that the following assistance will be necessary.

- a. Technical advice and assistance in putting up the communication plan. Due to lack of know-how, the TW staff cannot put up the plan themselves. A systematic approach will be required to establish the communication objectives, target audience, nature of message to be communicated, communication channels and budget [4].
- b. Technical advice and assistance in product and production management for internal reorganization on the lines discussed in section 5.1.2.
- c. Financial assistance (in terms of loan or donation) to facilitate the communication or promotion plan, and product and production management issues.

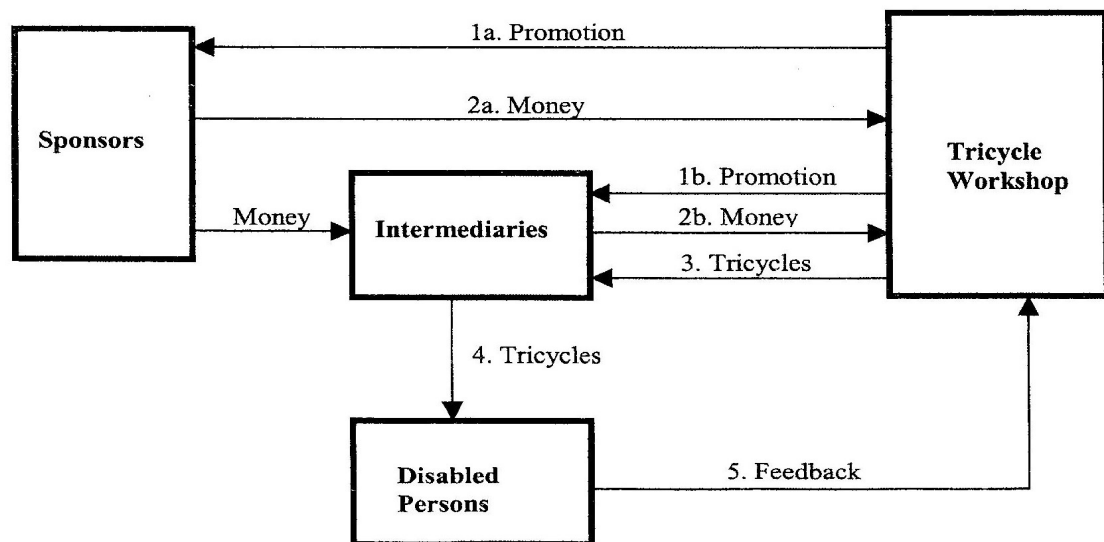


Figure 6: Proposed Promotion Channels for TW

6.0 LESSONS OF THIS STUDY FOR SMALL COMPANIES

It is right to generalize that the TW got into this situation mainly due to lack of technical know – how in Product Innovation (i.e. keeping an eye on internal and external issues) for business sustainability. It will now be difficult for the company to “restart” because of the above said requirements of technical and, more seriously, financial assistance. Had the workshop been aware and knowledgeable in product business innovation principles, it would most probably be financially sound and business would be running smoothly because there is market for tricycles.

It can further be generalized that the situation does not only apply to TW, it applies to many small companies in our society. For example, if one looks at the many furniture manufacturers along our streets nowadays, and at the number of small fabrication workshops dealing with door and window grills and gates, the following questions can be asked. Do these manufacturers sell their products? Do they strive to promote themselves and attract orders or do they just sit and wait for orders to come?

Talking informally to some of these companies it has become evident that the answer to these questions is generally NO and their cry is always “*Lack of orders or customers*”. Most of these businesses start up just by imitation from each other without any plan for self-image and sustainability. For product-oriented businesses, this is dangerous in a current growing competition. It may be appreciated that technological advancement can be achieved through innovation; that is, in doing something better than your competitor, improving on the products you are producing, and trying out new products for new markets. Our companies are not innovative enough because they “*sit and wait for customers*” or “*sit and wait to copy from a neighbour*”. These strategies cannot get this particular sector anywhere, so the “*lack of customers*” cry will continue for these companies.

Obviously it cannot be expected that our small companies will change this situation on their own, as indeed most of their staff are not well educated. Hence, they won't be in a position to do innovation in the business arena. What

is required for this situation is an advisory body or organization that can play the role of advising these small companies so that they can be innovative and self-sustaining, and can therefore develop as a result of competition.

7.0 CONCLUSION AND RECOMMENDATIONS.

7.1 Conclusions

1. The problem at TW was business stagnation due to “*lack of orders*”.
2. The conducted study based on the Product Innovation Process, has shown that the “*buy-supply*” system of tricycles is complicated, involving several parties including users (disabled persons), manufacturers, intermediaries and sponsors.
3. Within this “*buy-supply*” system, it was found, TW failed to promote its name and services in the past to the rest of the parties, especially the sponsoring organizations, which could have influenced the coming of orders to the Workshop. It has been suggested that TW needs to act on a communication plan so that local and foreign sponsors, and intermediary parties can know it. However, before this can be done, the workshop requires to be internally organised first in terms of product design and production management.
4. Projecting this study to small companies in our society, it is observed that this problem of “*lack of orders*” is quite common. The main reason for this, as was found out for TW, is the lack of technical know-how in the companies to deal with product innovation and business issues.

7.2 Recommendations

1. It is recommended to establish an advisory organisation that can give advice to small companies so that they can always be abreast with business trends through innovation management. This should enhance the companies' self-sustainability, competition and general technological development.
2. The nature of such an advisory organization is to find out what can really be advised and how. Its services

and funding need to be looked into before this idea is put into practice. This could be a follow-up work to the present study and it is worth researching into. It will also be interesting to find out what is done by organizations like SIDO in this respect.

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