

Environmental Corporate Social Responsibility Management, ECSRM and Strategy to Reshaping Consumer Behaviour

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Abstract. Plastics have become a major issue to our environment especially the unavoidable usage of plastic straws whenever you buy drinks. Plastic straws, lid and stirrer is not completely biodegrades. Ban the straws is not possible since it is an accessible tool to most of us especially to disable people. This issue can be solved with collective effort amongst the customers and companies to replace plastic straw with biodegradable straws. We review on the contribution and potential of consumer behaviour concept and marketing capabilities in initiating the right mindset in promoting pro-environmental behaviour. A feasible framework model is proposed to companies especially F&B companies. The framework comprise of two key issues (1) sustainable competitive advantage to companies (2) promoting pro-environmental behaviour amongst customers. The first key issue discusses about how companies can benefits from environmental friendly practice. These benefits comprise of sustainable branding, incorporating in corporate social responsible and better business performance. The second key issue discusses systematic perspective for F&B companies to promote understanding and changing environmental behaviour of their customers. Huge franchise chain F&B companies like McDonald and Starbucks support on biodegradable straw, lid and stirrer would contribute to a snowballing effect worldwide. McDonalds is in 100 countries and having more than 35,000 restaurants worldwide, is more than capable to promote pro-environmental behaviour to their customers. This paper provides a feasible framework for McDonalds and Starbucks to initiate the pro-environment lifestyle and experience towards sustainable competitive advantage. We also propose some strategies suggest to reshaping consumer behaviour which include the government, company and customer. Thus, provide recommendation to carry more studies on ECSRM model and preventive measure in managing plastics issues for future research.

1. Introduction

Environment problem cause by plastic is a classical phenomenon that created by mankind the whole ecosystem. In the recent world economic forum, the issue of plastics was raised and some of the experts presented that by 2050, our oceans will be filled by plastics more than fish. World Bank also supported the statement with their estimation of 6 tons of plastic waste produced each day by 2025 [1]. In the tons of plastic debris, the most found item is plastic straw. This staggering finding also happens whenever there is an ocean coastline cleanup [2].

In United States, millions of plastics straws thrown each day, meanwhile United Kingdom contributes 4.4 billions of straws annually references. Hotels are the main offender of plastic straws. Hotel like Hilton Waikoloa Village was the first hotel to ban plastic straws this year onwards as they used more than 800,000 in previous year [3]. Straws are especially dangerous to seabirds, as they could easily pick up and swallow, suffocating and choking the bird. In fact, over 1 million seabirds die each year for not digesting plastic [4].

The common question raised here is that how can plastic straw possibly be causing so much damage to the environment? First plastic straw is a single-use plastic item. Secondly, it's lightweight in nature which makes it easy to be littered around even during garbage collection or through mechanical recycling sorters. Thirdly, due to it's lightweight nature, easily blown away by wind into oceans. In the oceans, this plastic straw will gradually be fragmented into many tiny pieces known as microplastics that commonly mistaken for food by marine lives [5]. Some mistaken for jelly fish, worm, grass and so on. Related incidences include sea turtles accidentally swallowing the straw, and then had it stuck up its nostril [6].

Recycling industry has increased tremendously in the past decade. Nonetheless, the amount of plastic waste increased annually. Biodegradable plastics consist of different blends of plastics. Some faced rejection by consumers and manufacturers due to lack of flexibility, strength or toughness of conventional plastics. Most biodegradable plastics waste could be managed by composting and anaerobic digestion. Some end up in soil and river. Polylactic acid (PLA) is among the most popular biodegradable plastics but not home compostable. Though it needs high temperature to breakdown but could not be completely degradable, unless with polycaprolactone (PCL). With PCL, PLA would degrade completely to carbon dioxide, biomass and water [7].

Undeniably that plastics blend would create a new way to manage plastic waste. Decomposed under conditions of anaerobic digestion would produce desirable outcomes. Nevertheless this condition works for only two types of plastics such as polyhydroxybutyrate (PHB) and thermoplastic starch (TPS). This condition could only be carried out with industry composting [8]. Hence, biodegradable plastics are not a panacea for plastic pollution, and they must be managed carefully after they leave the consumer.

1.1. Plastic Waste Management in Malaysia

The plastic Waste Management is an industry by itself. Based on the study completed by Japan International Cooperation Agency, households and businesses produced 8% and 30% plastic waste respectively. From this amount, the recovery rate was only 5% and 7% from both households and businesses respectively. This industry is highly depending on both the local and international market demand for resin and crush form of plastic. There are few challenges identified in term of production of degradable and biodegradable plastic. The main implication is that it could lead to contamination of recycled plastics by biodegradable or degradable plastics. The following challenges are expensive, technology not available, insufficient raw materials and low market demand [9]. Generally recycling awareness is still deprived among the consumer. Some plastic producers commented that the government had not doing enough in promoting recycling and supporting their existence and sustainability. The key success of this industry is mainly comes from technology, cost, raw material availability and material quality [10].

1.2. Malaysia consumer awareness

Based on the survey conducted by Jabatan Pengurusan Sisa Pepejal Negara , approximately 66% of the consumers knew about degradable plastics and about 90% of an average of 200 respondents supported biodegradable plastic bags usage. In conjunction with "No plastic Bag campaign on Saturday Campaign, about 70% of 270 consumers supported the campaign, 33% of the consumer either not supported or willing to pay addition 20 cents to buy plastic bags or shopping elsewhere [9].

Though majority of consumers are aware of the harmful of plastic to environment but a considerably large portion of consumers are still not giving up the practice or habitual of using plastic bags. This habitual is highly related to the consumer mindset and behaviour. Reshaping the consumer behaviour is important in this context. Though there are many challenges to overcome in this process of reshaping the behaviour

but it would be priceless effort for long-term purposes. The cost of environmental conservation could easily reach a few hundred billion USD a year if consumers continue with their plastic habitual [11].

2. Objectives

The many heartache stories inspired the authors to derive with the following objectives:

- a) To propose an ECSRM model to re-establish a known brand name company to another higher level.
- b) To suggest strategy to reshape consumer behaviour which include the government, company and customer.

3. Model

This model is known as Environmental Corporate Social Responsibility Management, ECSRM is practically reengineered from a widely accepted Urde's brand management model with environmental CSR dimensions. Combination like this will be more attractive to profit oriented company where it guides the proper way to manage their ECSR contributing to branding, potential target audience and foremost important business sustainability.

3.1. Internal considerations

Internal considerations is adapted from Carroll's CSR model upon which it has been utilized by a number of different theorists. This model is widely cited in articles mainly in the area of social issue in management and business society [12].

In ECSRM modelling, the internal considerations adapted some dimensions of Carroll's model. The dimensions are E-Philanthropy, E-Community Services and E-Customer Welfare.

The following section will discuss these dimensions further.

3.1.1. E-Customer Welfare

An excellent customer experience is a core element for most successful firm [13]. Generally, e-customer welfare initiatives are intended to create and deliver the best product for customers, complete product information, or provide safety product to them [14]. This also includes providing eco-friendly product to customers and ensuring the product condition offered to customers is not harmful to the environment. Referring to F&B industry, their product should be of quality, provide information on nutritious value, do not contain harmful materials. Above all, this dimension emphasizes eco-friendly practices right from the preliminary stage until the end-user stage. Companies like McDonald and Starbucks have successfully replacing plastic bags with paper bags in almost all stages of the operation. Plastics are still widely used for plastic straws, paper cup lids and coffee stirrer. Though these plastic tools are useful especially for disables but it contributes to proportional amount of plastic waste. It would be using biodegradable material to manufacture these plastic tools.

3.1.2. E-Community Involvement

CSR initiatives through social and community involvement are accomplished by involving members of the community in any CSR programs [15]. McDonald is widely known as the leader in F&B industry, it is more than capable to initiate paradigm shift and culture change worldwide. This globalize company successfully promotes the Americanization concept, followed by glocalisation to suit the locals better [16]. Author believes that McDonald will be the right brand to effective approach the world community to support environmental programme. For instance, environmental education workshop and promote biodegradable straws as a new and cool lifestyle.

3.1.3. E-Philanthropy

Philanthropy is the core category of CSR activities. Philanthropy is stated as the organisation's desire to promote the welfare of others, expressed especially by generous donation of money to good causes. A recent study indicates that acts of philanthropy toward a certain humanitarian cause, health, education and

participation in other community building programs have shown to ignite sense identification and loyalty among customers. In ECSRM context, philanthropy like McDonald should be seen as a world role model when it comes to environment. Generously sponsor events concerning plastic waste and provide funding for study related to environment conservation in order to cultivate this kind of culture. On the other hand consumers research have also shown that consumers are more willing to purchase from companies that show higher commitment to environmental protection. Some would demonstrate their environmental commitment by their willingness to purchase quality green products, even at slightly higher prices [17].

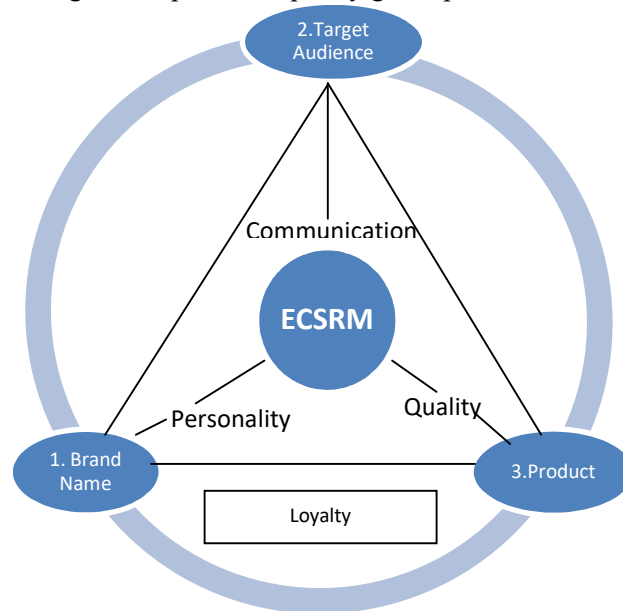


Figure 1. Modified ECSRM model

3.2. External considerations

Aligning to the three dimensions of internal considerations, three other equally important external considerations based on Urde's model, the brand hexagon [18]. This model is modified create a brand concept for ECSRM as shown in figure 1. ECSRM is part of the product that has a functional as well as a symbolic component. Let's look at McDonald's soft drink, a biodegradable straws and lid provide the functional component while the entire soft drink product representing the symbolic value to the company.

3.2.1. Brand Name

Here is the answer to why establish brand name is needed to makes this modelling works better. While individual actions can have a significant impact on the environment and influence in the industry, a ban from a single hotel chain can remove millions of straws in a single year. Ananatra and Avani hotel and resorts estimate their hotels across Asia used 2.49 million straws in 2017 and AccorHotels estimates using 4.2 million straws in the U.S. and Canada last year as well [19].

Working with established Brand Name is important to remove the plastic straw concept. It will not be as effective if ECSRM is applied to non-Brand Name company as this moment in time especially for Asian society. This society is still not ready to change their daily plastic usage due to massive availability and demand and costing. Amongst the major reason is a low literacy lead to poor health awareness and primitive mindset. Brand like McDonald's offers a life changing dining experience to many people relevance with its tagline "I'm Lovin it", would be a good initiator to change consumer mindset to be more pro-environment and use biodegradable product instead of plastic [20]. A well establish brand name will be the first stage for this ECSRM to be successful; likewise, ECSRM will also contribute to further strengthen the Brand name. Positive brand name is proven to contribute and enhance customer's trust toward the firm's products or services [21]. If McDonald's successfully practice full pledge eco-

friendly operation, this will create a whole new value added branding for McDonald's with a promising sustainable business in the future. As an environmental symbolic business is an important area of strategic business plan to capture the younger and future customer segments by planning ahead of their competitors and gaining better competitor advantage.

3.2.2. Target Audience

The second stage of ECSRM is tapping the right target audience which place as the highest priority in the area of marketing in this modeling target audience comes after brand name because brand name play a more important role to the success for ECSRM at the initiator or preliminary stage of promoting environmental paradigm shift and ban the use of plastics. However targeting the right audience/ customer is important to ensure that company receives a good respond and support to their newly launch environment program and educational workshops. Furthermore, communication plays a major role in this concept, because through communication the ECSRM can be explained to the customer. Generation Y and Z having more pro-environmental mindset due to factors such as exposure to technology and higher literacy, hence they are more supportive to pro-environmental programs [22]. Company that target this segment should embed eco-friendly process, McDonald's is a typical example where they expand their current ageing segments to a younger segment by incorporating more eco-friendly process in their operation in order to build a whole new level of loyalty. Long-term loyalty is created not only through the function of the product but symbolic value that attach to the brand name. New way of communication has make it possible for everyone to access to information without boundary. McDonald's is amongst the first F&B own an App to have more effective communication with the younger customer segments [23]. A well establish brand name with massive target audience and above all owning a powerful tools of communication is on the right track to move to the third component of the external considerations.

3.2.3. Product (Pasta Straw)

The product component is referring to the biodegradable straws, cup lid and coffee stirrer. The right brand name with the right target audience is essential to create the awareness on this eco-friendly product. For McDonald's, it will not face any competitor but will enjoy being the leader in the market to introduce biodegradable straws in F&B industry through awareness pro-environmental program. Their customers will support their eco-friendly operation since younger and future segments are ready for the change. Equally important issue when comes to biodegradable product is price. With great amount of research comparing the price quotation, the best price comes from straws that make of pasta or better known as pasta straws. A straw with an averagely cost of US\$0.02 and the price is expected to be lower with greater order volume. This type of straws will not affect any type of cold drinks as room temperature will not hit its' melting point. This straw can be edible like any pasta and definitely not harmful as compare to plastic straws. The same material will be proposed for coffee stirrer and cup lid. If these products receive good acceptance from their customers, in return it will associated to it brand name. The alternative types of straw are shown in table 1 below:

Table 1. Quotation from difference straws companies

Company	Product	Price \$USD	Quantity	Per piece \$USD
Aardvark , (A)	Paper straw	167.65	3200	0.052
Bio Strohhalm, (B)	Paper straw	8.50	50	0.17
FinalStraw, (C)	Reusable straw	30	1	30
Bunkoza, (D)	Stainless steel	15.75	1	15.75
Softy Straw, (E)	Reusable silicon	11.99	5	2.39
PastaStraws, (F)	Pasta straw	69.90	1000	0.0699
EcoStraw, (G)	Pasta straw	9.80	20	0.49
StrawFree.org, (H)	Bamboo straw	1.80	1	1.8

There are basically two types of straws, single-use and reusable straws. The reusable straw is more costly as make of stainless steel or silicon. The choice of single-use straw is ether paper straw or pasta straw. PastaStraws is selling at \$0.0699 per piece as compare to a cheaper paper straw supply by Aardvark , (A) with the different of \$0.018 per piece. Nevertheless straw make of pasta is safer compare to make of paper. Pasta straw is edible to all living things and zero harmful to environment. Hence pasta straw will be the best alternative for amongst others as single-use straw in term of cost and safetiness. The testimonials shown below are from the pasta straw users and owners from F&B outlets.

Table 2. Testimonial of Pasta Straws Users

Testimonial of Pasta Straw users	Remarks
Dawn Bye [24]	Served pasta straw in her wine and beer cafe. Claimed that pasta straws have no taste, withstand well in water and for a long length of time. The costs of pasta straws are comparable to plastic. Above all, felt happier for contributing to care for Mother Nature.
Meghan Burkett [24]	A recycling coordinator. Claimed that plastic straws not easy to recycle due to light weighted, small and easily slip away from recycling facility.
Ms. Karen [25]	An Ice Cream cafe owner. She introduced pasta straws to her customers and received good response and high acceptance.
Ms. Watson [25]	Continue to use pasta straws because it can be decompose by bacteria or other living organism, pose no threat to animals and no need to be recycled as they are edible. Pasta straws do not go mushy and do not affect the taste of any drinks.

Based on table 2 above, the price of pasta straw were comparable to plastic. The pasta straw would not affect the taste of any beverages. Most importantly all the owners were glad that their customers could accept pasta straws and with the customers support they would continue to contribute to saving the Mother Earth.

4. Strategy to Reshaping Consumer Behaviour

The other objective of this paper is to suggest some strategies to reshaping consumer behaviour which include the government, company and customer. The consumer behaviour here involves three kinds of parties, the government, company and customers. The emphasis here focuses on preventive measures to minimize the burden for the company and government.

4.1. Government- Company-Consumer Relationship

At the government level, the strategy is to implement policy to encourage company to adopt eco-friendly straw concept. Mestec is Ministry of Energy, Science, Technology, Environment and Climate Change in Malaysia recently initiate #plasticfreemestec campaign, the minister YB Puan Yeo Bee Yin addressed that plastic pollution is our shared responsibility and in support of the Sustainable Development Goals (SDGs), many grants and funding are available for companies to adopt eco-friendly concept and carry out R&D to improve their process to be less harmful to the environment.

Other than that, government can offer incentives for recycling and reusable practices, offer levies to invite more company to anticipate in eco-friendly program or even endorse strict rules to ban certain plastic materials products.

Though dozens of governments have gradually supporting the usage of disposable plastics by introducing more policies as a way to a healthy and plastic free society, nonetheless many countries around Asia still favouring single-use plastic concept. Governments in these countries play an important role to make both local and foreign direct investment companies to work together with them to achieve the plastic free society. Companies who choose to ignore the governments' initiatives, perhaps stern

action should be taken against them [9]. For example block the companies from renewing their license, perhaps taken away their tax incentives, fiscal incentives increase their corporate tax and compound them. Government is the first and most important level to initiate and enforce all the companies and SMEs to comply with the policies and create awareness at society level through campaign at school level.

4.2. Company –Customer Relationship

At this level, company should replace plastic straw with alternatives like pasta straw, paper straw, bamboo straw for their single-use straw. There are many companies that produce alternatives to plastic straw, companies can liaise with their suppliers for a better price. Suppliers also should play their role well in increasing the awareness where they should provide more promotion to the companies in supporting governments' mission. In relation to push strategy, government is pushing the supplier for produce more pasta straw by providing them subsidies, incentives and support. Subsequently, suppliers produce more than the demand, and push the companies to stock more by giving them lucrative price and discount if they stock more [9]. The companies with lots of pasta straw will eventually give away to their customers. This is away to create more awareness amongst their customers. At the same time, companies that give away pasta straws are directly rebranding their image and reputation for being loving environment and society as a whole.

Eventually their existing customers will trust the company even more and new customers will buy from the company. Campaign and advertisements in Facebook or any digital platform that create the awareness are in fact creating the pull strategy. All these generating the pull effect where consumer are aware of the existence of pasta straw and being able to anticipate in saving environment by supporting companies that give away the pasta straw and more importantly they will less guilty for not using plastic straw, in fact they are doing the CSR too as in citizen social responsibility.

5. Conclusion

This paper propose ECSRMM modelling for well establish F&B brand like McDonald's. The internal considerations comprise of three dimensions as in E-Community Involvement, E-Philanthropy and E-Customer Welfare represent the point of departure and the reasons for ECSR existence. The internal considerations are communicated via the external considerations (brand name, target audience and product). The closely linked to each other and constitute together the basis for the ECSR management. Loyalty, association and awareness build the fundamental inner relationships in this model. Awareness is the first step. Without awareness, the ECSRMM is not recognized by the consumers and cannot be further built up. Following, the ECSRMM is differentiated when attitudes and feelings are created through associations and finally, a strong relationship and loyalty are created through the communication of the ECSRMM.

This paper also suggest some strategies to reshaping the consumer behaviour right from the government level to company level and end with consumer level. The government, company and consumer have to support the idea of using pasta straw, hence establishing a strong relationship amongst them is important. Convincing the companies to adopt a new idea in expand of their profit is not an easy task. With ECSRMM modelling, any eco-friendly idea will sound more convincing and profitable.

6. Recommendation

For future study, a more in depth study should be carried out on ECSRMM model on actual companies that plan to embark into creating a better brand name and ECSR. Our recommendations also emphasis on the preventive measures and that of minimizing the administrative burden to the government. These recommendations are neither mutually exclusive nor exhaustive: there maybe additional measures that would successfully contribute to the more sustainable activity of reuse and recycling of plastic in Malaysia. These recommendations also take into account the waste hierarchy of prevention, reuse, recycle and recover.

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Introduction

- By 2050, our oceans will be filled by plastics more than fish. World Bank estimates that 6 tons of plastic waste produced each day by 2025 [1].

Problem Statement

How can plastic straw possibly be causing so much damage to the environment?

- single-use plastic item, lightweight and flown into oceans gradually be fragmented into many tiny pieces known as microplastics that commonly mistaken for food by marine lives [5].

Plastic Waste Management in Malaysia

- biodegradable plastics could lead to contamination of recycled plastics
- Expensive, technology not available, insufficient raw materials and low market demand [9].

Malaysia consumer awareness

- still deprived among the consumer.
- government had not doing enough in promoting recycling and supporting their existence and sustainability.
- “No plastic Bag campaign on Saturday Campaign, about 70% of 270 consumers supported the campaign, 33% of the consumer either not supported or willing to pay addition 20 cents to buy plastic bags or shopping elsewhere [9].

Objectives

- a) To propose an ECSRM model to re-establish a known brand name company to another higher level.
- b) To suggest strategy to reshape consumer behaviour which include the government, company and customer.

Objective 1: Propose Model

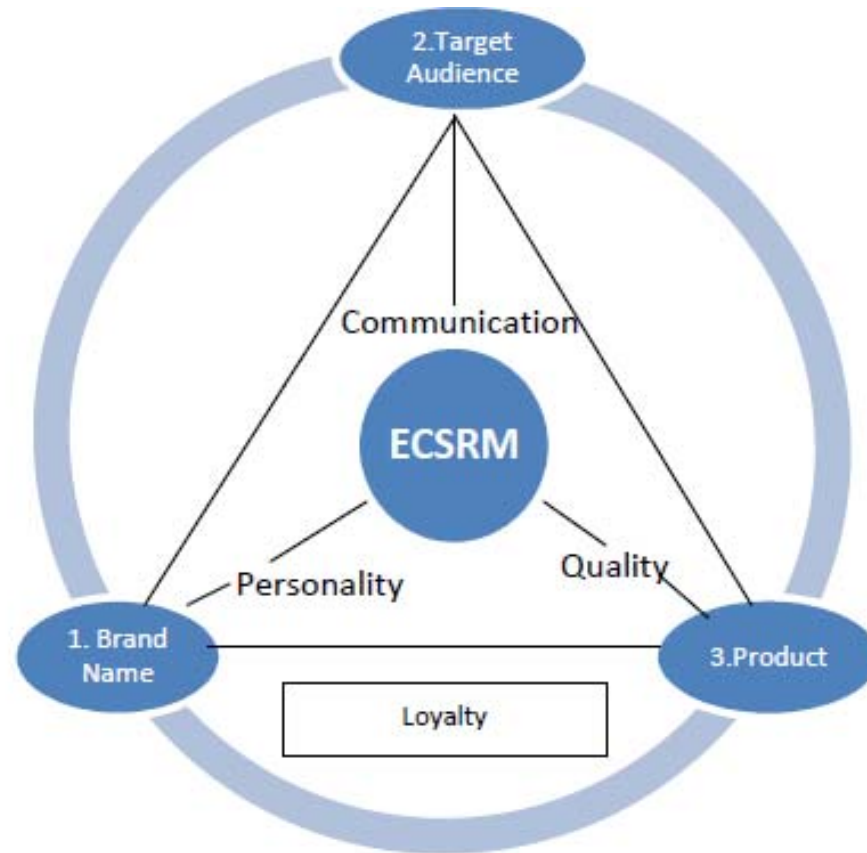


Figure 1. Modified ECSR model

Propose Model

Brand Name

- To create domino effect.
- Ananatra and Avani hotel and resorts estimate their hotels across Asia used 2.49 million straws in 2017 and AccorHotels estimates using 4.2 million straws in the U.S. and Canada last year as well [19].
- Not as effective for non-establish brand.

Propose Model

Target Audience

- to ensure that company receives a good response and support to their newly launch environment program and educational workshops.
- communication plays a major role in this concept.
- Generation Y and Z having more pro-environmental mindset -exposure to technology and higher literacy, hence more supportive to pro-environmental programs [22]

Brand Name + Target Audience

- A well establish brand name with massive target audience and above all owning a powerful tools of communication is on the right track to move to the third component of the external considerations.

Product (Pasta Straw)

- single-use and reusable straws
- Price quotation

Table 1. Quotation from different straws companies

Company	Product	Price \$USD	Quantity	Per piece \$USD
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- The choice of single-use straw is either paper straw or pasta straw.
- The reusable straw is more costly as made of stainless steel or silicon.
- Pasta straw is edible to all living things and zero harmful to environment.
- Hence pasta straw will be the best alternative for amongst others as single-use straw in terms of cost and safety.
- This type of straws will not affect any type of cold drinks as room temperature will not hit its' melting point.
- The same material will be proposed for coffee stirrer and cup lid.
- If these products receive good acceptance from their customers, in return it will be associated to its brand name.

- For McDonald's, it will not face any competitor but will enjoy being the leader in the market to introduce biodegradable straws in F&B industry through awareness pro-environmental program.
- Their customers will support their eco-friendly operation since younger and future segments are ready for the change.

Testimonial of Pasta Straw Users

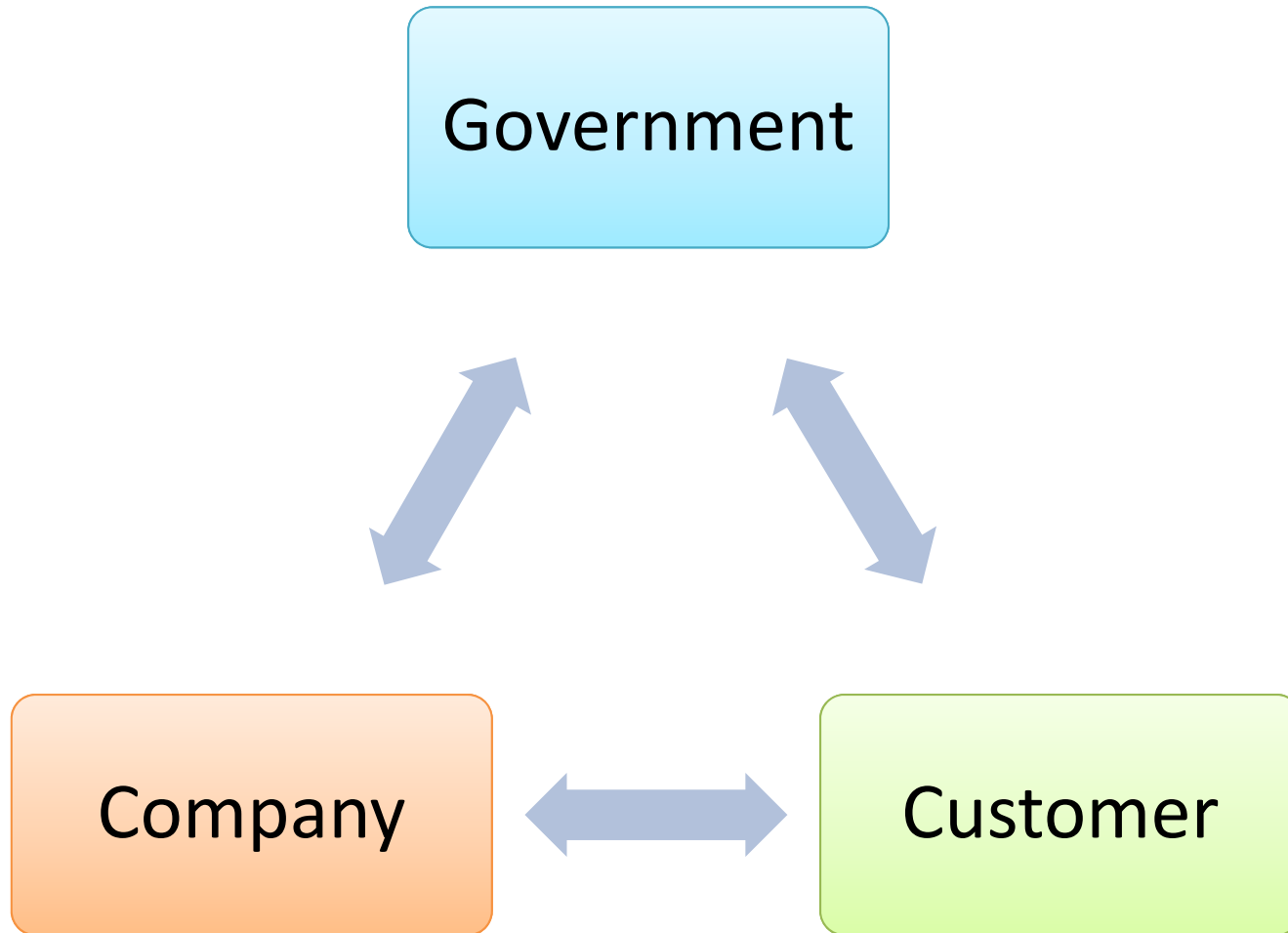
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Objective 2: Strategy to Reshaping Consumer Behaviour

- The other objective of this paper is to suggest some strategies to reshaping consumer behaviour which include the government, company and customer.
- The consumer behaviour here involves three kinds of parties, the government, company and customers.
- The emphasis here focuses on preventive measures to minimize the burden for the company and government.

Strategy to Reshaping Consumer Behaviour



Strategy to Reshaping Consumer Behaviour

- At the government level, the strategy is to implement policy to encourage company to adopt eco-friendly straw concept.
- Mestec is Ministry of Energy, Science, Technology, Environment and Climate Change in Malaysia recently initiate #plasticfreemestec campaign, the minister YB Puan Yeo Bee Yin addressed that plastic pollution is our shared responsibility and in support of the Sustainable Development Goals (SDGs), many grants and funding are available for companies to adopt eco-friendly concept and carry out R&D to improve their process to be less harmful to the environment.
- offer incentives for recycling and reusable practices, offer levies to invite more company to anticipate in eco-friendly program or even endorse strict rules to ban certain plastic materials products.
- Companies who choose to ignore the governments' initiatives, perhaps stern action should be taken against them [9].
- For example block the companies from renewing their license, perhaps taken away their tax incentives, fiscal incentives increase their corporate tax and compound them.
- Government is the first and most important level to initiate and enforce all the companies and SMEs to comply with the policies and create awareness at society level through campaign at school level.

Company and Customer Relationship

- companies can liaise with their suppliers for a better price.
- Suppliers should support governments' mission.
- Push Strategy- Government is pushing the supplier to produce more pasta straw by providing them subsidies, incentives and support.
- suppliers produce more than the demand, and push manufacturer and wholesaler to stock more by giving them lucrative price and discount if they stock more [9].
- The companies with lots of pasta straw will eventually give away to their customers.
- Pull Strategy-Campaign and advertisements in Facebook or any digital platform that create the awareness are in fact creating the pull strategy. All these generating the pull effect where consumer are aware of the existence of pasta straw and being able to anticipate in saving environment by supporting companies that give away the pasta straw and more importantly they will less guilty for not using plastic straw, in fact they are doing the CSR too as in citizen social responsibility.

Conclusion

- This paper propose ECSRM modeling for well establish F&B brand like McDonald's.
- The internal considerations comprise of three dimensions as in E-Community Involvement, E-Philanthropy and E-customer Welfare.
- The internal considerations are communicated via the external considerations (brand name, target audience and product).
- This paper also suggest some strategies to reshaping the consumer behaviour right from the
- government level to company level and end with consumer level.
- Convincing the companies to adopt a new idea in expand of their profit is not an easy task.
- With ECSRM modelling, any eco-friendly idea will sound more convincing and profitable.

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Plenary Speaker



Prof. Ibrahim Dincer

Editor-in-Chief (International Journal of Energy Research);
2017 Highly cited researcher by Web of Science;
Full Professor, University of Ontario.

Keynote Speaker



Prof. Wei-Hsin Chen

Editorial Board Member (Applied Energy);
2017 Highly cited researcher by Web of Science;
Distinguished Professor, National Cheng Kung University.



Prof. Dennis Y. C. Leung

Editorial Board Member (Applied Energy, Applied Sciences, Progress in Energy and Journal of Power & Energy);
2017 Highly cited researcher by Web of Science;
Professor and Associate Head, Department of Mechanical Engineering, The University of Hong Kong.



Prof. Michael K. H. Leung

Editorial Board Member (Applied Energy);
Professor and Associate Dean, School of Energy and Environment,
City University of Hong Kong.

Invited Speakers

Prof. Chin-Hsiang Cheng

National Cheng Kung University, Taiwan

Dr. Alex Lee

Tian Building Engineering (SG), Singapore

Mr. Anthony K. H. Wong

Asian Overland Services Sdn. Bhd., Malaysia

... more speakers will be announced

Important Dates

Abstract submission: ~~Aug. 17, 2018~~ **Aug. 31, 2018** **Sep. 23, 2018**

Notification of acceptance: ~~Sep. 07, 2018~~ **Oct. 07, 2018**

Early registration: **Oct. 10, 2018**

Normal registration: **Nov. 10, 2018**

Full paper submission: **Nov. 25, 2018 (optional)**

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