Balanced Entry Strategy Map: Demonstrating Utility Using Pharmaceutical Collaboration Case Studies

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(A) Introduction

Context: The Need to Evaluate Effectively

Collaboration have been popular among businesses nowadays. Collaboration refers to coordination of efforts of different parties to achieve a common goal. Many studies and feature articles have claimed that collaboration is the key to future success. However, there is often a lack of qualitative or quantitative evaluations to portray the effectiveness of collaboration in a concrete way.

The Balanced Entry Strategy Map is designed as the tool for comprehensive evaluation of collaborative efforts and identify problems at a glance. Inputs and outcomes of all key collaborators are mapped on one single form to visualize causal relationships at different levels. Inspired by the balanced scorecard, the balanced entry strategy map analyze collaborative elements in 4 perspectives: customer, financial, internal processes and learning & growth. The core criteria for an effective collaboration is that inputs and outcomes have to fulfill their respective objectives that are aligned with the central mission of the project.

Through collaborating with parties specifying in certain areas, the industries can utilize larger proportion of external financial resources and achieve goals more efficiently. Furthermore, companies can strengthen traditional weaknesses and assess new technologies during cooperation. In order to strive for future achievements, the primary step is to overcome problems existing currently. Thus, this report will demonstrate the use of the balanced entry strategy map as the tool to evaluate collaborations effectively in order to foster better collaboration practices in the future.

The report will utilize the collaborations pharmaceutical industry to demonstrate the utility of the balanced entry strategy map. In the midst of the COVID-19 pandemic, our world is experiencing a global crisis. According to the World Health Organization (WHO), five out of the ten threats to global health in 2019 are directly related to diseases such as noncommunicable diseases, influenza pandemic, Ebola, Dengue and HIV[1].The pharmaceutical industry, as one of the five largest industries in the global economy is a stakeholder and are current facing a shifting industry dynamics. Unlike other stakeholders, such as governments and hospitals, which are mostly public, the pharmaceutical industry is highly profit-driven and competitive. The conflicting nature of this industry makes it valuable to be investigated.

Abstract

The purpose of this research is to propose a sound evaluation model, named Balanced Entry Strategy Map, as an efficient tool to evaluate the effectiveness of collaborations. Collaboration is being widely adopted by businesses as a strategy to achieve mutual benefits through synergtic efforts. Though advantages of collaborations are apparent, many fail to reach intended goals due to multiple reasons. Therefore, by designing and adopting a specific evaluation model inspired by the Balanced Scorecard, businesses could efficiently discover problems hindering the success of their partnerships and rate their performances. Case studies of pharmaceutical collaborations are adopted to demonstrate utility of the model. It is proven to be a desirable collaboration evaluation tool and may possess potential to serve as a evaluation model for more other processes as well.

Author

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Kristy is a freshman of the School of Social Sciences at Tsinghua University, currently pursuing a Bachelor of International Relations. She is born and raised in Hong Kong. Growing up in a city of diverse cultures, Kristy has demonstrated great interest in collaboration between international organizations. She is an all-rounder and is eager to explore new areas of knowledge. Kristy is proficient in Spanish and has obtained a BTEC certificate on Creative Digital Media Production during highschool. Kristy also practices athletics and badminton. The Global Innovation Strategy course has also allowed her to challenge herself to push her limits and conduct research she has never tried before.

Logic Model

Context

Collaboration is a popular strategy adopted by many businesses in the world. While some partnerships thrive, many would fail even between capable companies. There are rarely standard models tailor-made for assessing collaborative efforts. There is a need for an evaluation system that extract key information from the collaboration for analysis in order to prevent repeating fatal mistakes.

Goal

Create a sound evaluation model and prove its utility.

Outcome	Output
Provide an evaluation tool that is considered worthy of trial by at least 3 professional strategists.	Paper-based publication explaining and visualizing the concept and design of the evaluation model. Cases study analysis that utilize the the evaluation model
Activities	**Inputs**
Construct and optimize model design	Academic papers and news articles
Investigate case studies	Case study reports
Sort and comprehend previous studies	Diagram design softwares

External Factors

Difficulties in accessing certain sources due to restricted clearance to private databases and

company confidential documents

(B) Methodology

Inspiration: Balanced Scorecard System

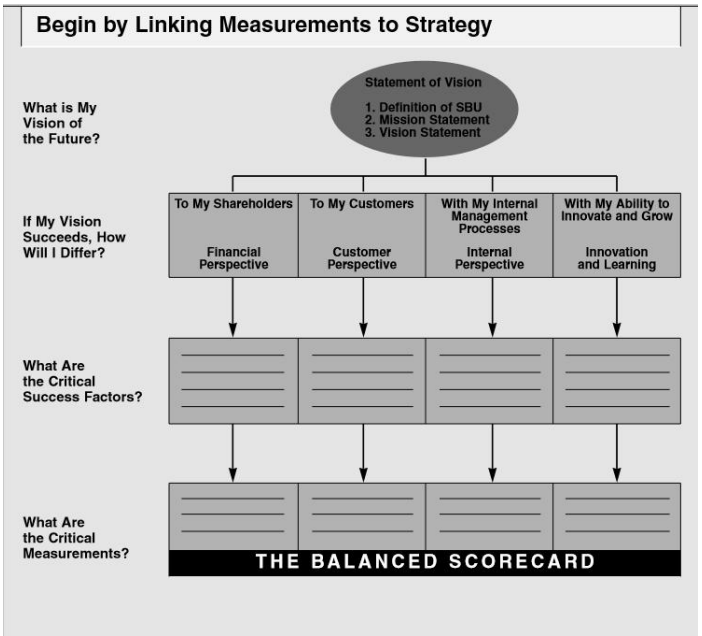
The Balanced Entry Strategy Map is highly influenced by the Balanced Scorecard. The Balanced Scorecard System defines 'measures that drive performance', according to Harvard Business Review[2]. It is a corporate performance evaluation system that consider an all-rounded collection of parameters including finance, internal processes, innovation and improvement as well as customer satisfaction in order to derive a clear performance attention focus. This provides managers with a balanced presentation on both financial and operational elements revolving around organization vision and strategy.

- The balanced scorecard targets four fundamental questions:
  - How do customers see us? (customer perspective)
  - What must we excel at? (internal perspective)
  - Can we continue to improve and create value? (innovation and learning perspective)
  - How do we look to shareholders? (financial perspective)

Each perspective is equipped with a double entry scorecard with two sections: goals and measures. Each measures correlates with a specific goal which can be continuously modified according to different situations. This understanding help managers 'transcend traditional notions about functional barriers'[6] which benefits both decision-making and problem solving.

Balanced Scorecard as the Strategy to Ensure and Measure Collaboration

The Balanced Scorecard was developed by Dr. Robert Kaplan and Dr. David Norton as performance management tool to measure strategic performances of companies. Through linking strategic goals to a coherent set of performance measures, it drives executives' identify and focus on specific measures critical for success.

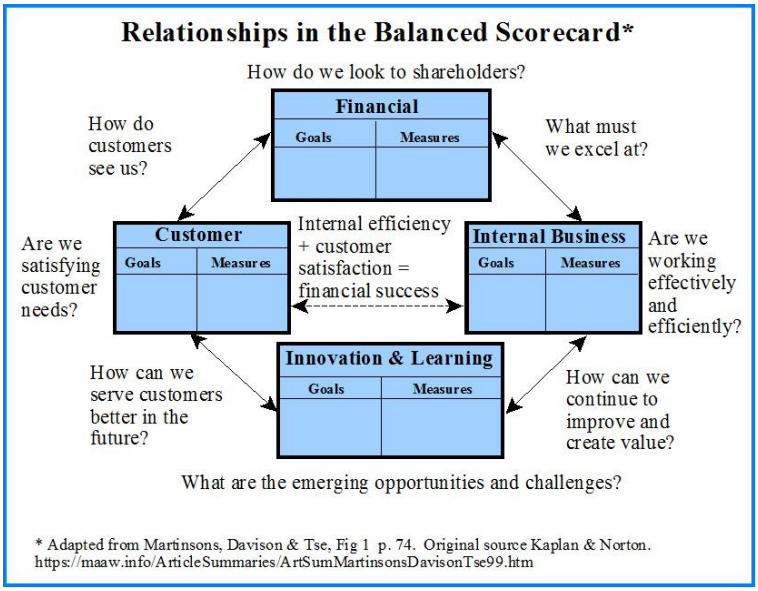


The system was designed to take both financial and non-financial parameters into account when evaluating the performance of companies, creating a wholesome analysis. The 4 basic perspectives are: financial, customer, internal processes and learning & growth.

The balanced scorecard intended to help executives to translate strategic objectives into tangible goals and actions while planning long-term performances and drive the process of change. It had a built-in measurement system to enable companies to keep operations consistent with long-term strategy by making regular scorecards to track process.

In Putting the Balanced Scorecard To Work (1993)[3], it was mentioned that one of the applications of the Balanced Scorecard is to act as a 'systematic repository for strategic information to facilitate long-term analysis and performance evaluation'. Though the balanced scorecard was built as a forward-looking performance management tool, we thought that this framework possess characteristics that could have potential to be used as a framework for evaluation of effectiveness of collaboration.

1. **Linking measurements to strategy**



Collaboration comes in different forms towards various goals. Unlike typical businesses where performance can be directly reflected through quantitative measures such as profits, there is yet to be a set of quantitative measures to measure the effectiveness of collaborations. The extent of the collaboration meeting the intended goals of collaborators will be the most direct reflection of the successful of the the project.

Therefore, through linking actions to objectives, we could evaluate effectiveness by comparing collaborators actions to their respective goals side by side to see whether actions taken fulfill their anticipated results. Through direct comparison, we can identify redundant actions or insufficient efforts towards failed objectives.

2. Analysis in terms of different perspectives

The balanced scorecard utilize both financial and non-financial parameters and analyze performance in 4 basic perspectives: financial, customers, internal processes, learning & growth. The specification of different perspectives emphasize the need to consider an all-rounded of factors when conducting evaluation.

Collaboration often occur across various processes from research, production to marketing. Therefore, the 4 basic perspectives can be modified to more specific processes and area of collaboration focus. For example, in the customer perspective, specific groups of customers can be labeled as the targets to serve. Effectiveness of collaboration can then be evaluated first through key processes.

Balanced Entry Strategy Map

Framework Design

Collaboration Project Name						
Central Mission						
Customer (Patient) Perspective Objectives						
	Inputs	Trigger	Alignment	Outcomes	Trigger	Alignment
Actor #1						
Actor #2						
Financial Perspective Objectives						
	Inputs	Trigger	Alignment	Outcomes	Trigger	Alignment
Actor #1						
Actor #2						
Internal Processes Perspective Objectives						
	Inputs	Trigger	Alignment	Outcomes	Trigger	Alignment
Actor #1						
Actor #2						
Learning & Growth Perspective Objectives						
	Inputs	Trigger	Alignment	Outcomes	Trigger	Alignment
Actor #1						
Actor #2						

Order of entry

[Mission & Objectives → Outcomes → Alignment → Inputs + Alignment → Trigger]

The specific order of entry is used as a sorting mechanism so that information is classified upon entry. Each statement in to form will be granted a unique code.

1. Mission and objectives of 4 perspectives: customer, financial, internal processes and learning & growth'outcomes' are defined.
   - The mission and objectives establish the standard of 'effectiveness' in the context specific to the collaboration. The inputs and outcomes will be judged and classified into 'accepted desirables' and 'caught violations' according to this contextual standard.

2. "Outcomes' are then entered into the form and classified into their respective perspectives. Each outcome will be judged on whether it fulfilled objectives within or/and across perspectives.

- The ‘alignment’ section is designed to check the degree of alignment of inputs and outcomes to their objectives.
- Indicate the objectives fulfilled by the outcomes (accepted desirables) or ‘X’ for outcomes that fail to fulfill objectives intended (caught violations)

3. Inputs will be entered into form after aligning outcomes to objectives. Similarly, inputs are classified under the 4 perspectives and state which objective(s) they are aimed to achieve.
   - Inputs are entered into the form under 4 perspectives according to their nature of action though inputs can be intended to achieve objectives at any perspective(s).

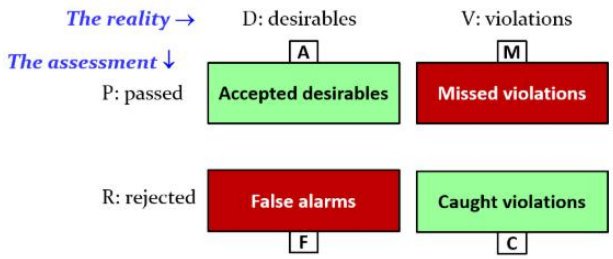
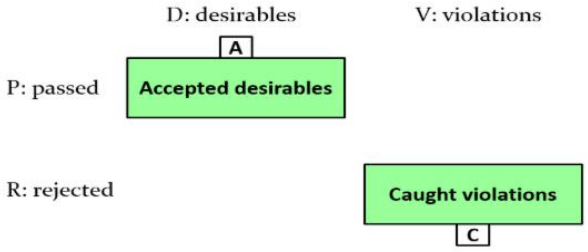
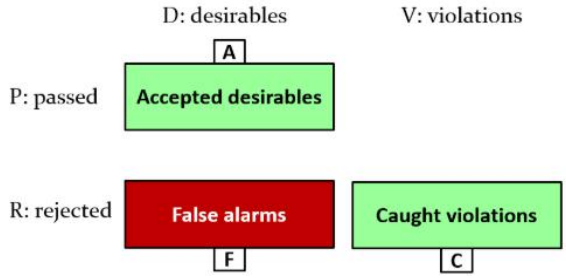
4. The last step is to fill in the trigger part by indicating the causal relationships between and across inputs and outcomes using the statement codes. The trigger section is used to indicate relationships in four directions: inputs to outcomes, outcomes to inputs, inputs to inputs and outcomes to outcomes.

Statement Coding System

Customer Perspective	C
Financial Perspective	F
Internal Processes Perspective	IP
Learning & Growth Perspective	LG
Objective	Ob
Input	In
Outcome	Out
and	+
From...to...	→

Maximizing Soundness and Precision of the Model

A sound analysis refers to an analysis that ‘reports all errors’ while a complete analysis refers to analysis that ‘reports only errors’[4]. However, in reality it would be impossible to achieve a perfect analysis that is both sound and complete. Therefore, the model would focus on maximizing its soundness by identifying outcomes that align to their objectives (accepted desirables) and catching as much outcomes that fail to fulfill its objectives (caught violations) as possible. Desirables increase collaborative effectiveness while violations decrease collaborative effectiveness.

All classified cases	
Perfect analysis	
Sound analysis, not complete	

1. Balanced Entry Style: Defining Relations with Precision

The balanced entry style is inspired by double entry bookkeeping used in accounting. Double entry bookkeeping present the flow of cash in terms of 'debt' and credit'. Utilizing this concept, the balanced entry style of the model helps defining precise causal relations between 'inputs' and 'outcomes' within and across actors and perspectives.

Input	➢ A statement of actions done by actors as a contribution to the collaboration ➢ Examples: investment of capital, conducting research, communications and sharing resources etc
Outcome	➢ A statement of observable events or changes in the degree of certain parameters, preferably supported by statistics ➢ Parameters example: efficiency, costs, level of trust, willingness to share risks and benefits

Related 'inputs' and 'outcomes' would then be grouped instantly by filling up the trigger section. Since it would impossible to ensure that all intended inputs would result in outcomes that affect the collaboration, only inputs that are directly relevant to the outcomes within the context would be included. Any unnecessary information that not involved in the causal chain would therefore be automatically discarded. Therefore, essential information would be concentrated and this helps

direct attention to areas worth focus instead of constantly navigating through heaps of data that is irrelevant in majority.

Furthermore, the balanced entry style also act as the visual representation of proportions between efforts contributed and resulting amounts of desirable outcomes. This will reflect the effectiveness of the collaboration. Desirable outcomes proportional to efforts contributed indicate an effective collaboration. Yet, the collaboration is not effective if an intense amount of input could only reap a small proportion of intended outcomes.

2. Mechanism to capture conflict of interests

2.1. Simultaneous evaluation of collaborators' actions

In this framework, the inputs and outcomes considering all the collaborators are displayed in a single form under different perspectives so that they can be evaluated in a simultaneous manner. This design opens another dimension of cross comparison in addition to the 4 perspectives, serving to further preserve soundness of the analysis.

During collaboration, actors' actions should be coordinated under a plan. Each of them will contribute in their area of expertise producing outcomes resulting from combined efforts. By directly placing actors against each other during evaluation, it would enable evaluators to easily identify any issues in the outcomes concerning uncoordinated or contradicting inputs. This can prompt actors to communicate and reorganize their inputs so that their actions are complimentary to each other. In another case, if there were no issues identified from actors' inputs nor their coordination yet outcomes were not desirable, this might point to problems arising from detrimental environmental factors that collaborators should pay extra attention to.

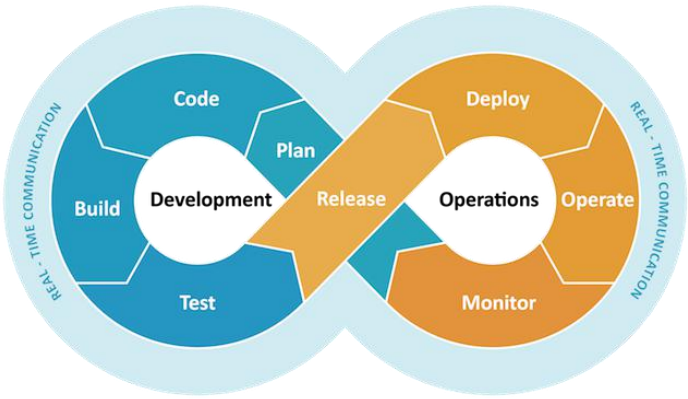
Moreover, the simultaneous presentation of partners' inputs and outputs on a single form would serve as a peer monitor mechanism. Partners could review and judge statements filled in by their counterparts to ensure that information is true. Collaborators could request for additional prove for unclear and suspicious statements. It would be highly recommended for collaborators to achieve joint approval on a final version of the completed form before drawing conclusions from results reflected from that certain version.

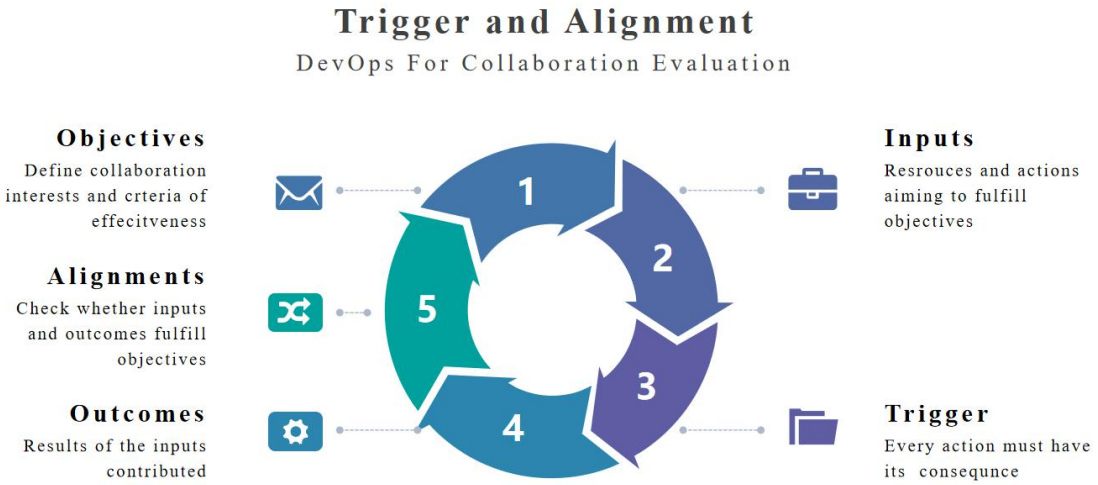
2.2. Trigger and alignment: DevOps for Collaboration Evaluation

DevOps[5] in software development is a set of practices that continuously automate and integrate processes between developers and managers. Traditionally, developers and operators worked in silos. Developers will write large chunks of software code in months times which will be deployed by operators. Yet, since development and deployment environments were different, bugs often arise during deployment and operators would need to return codes to developers for debug, which would take a prolonged period of time to do so.

Developers will write codes and in small chunks which will be tested and integrated automatically

within hours and deployed by operators immediately upon verification. In this case, developers and operators can identify smaller problems instantly and regularly. Deployments are made more efficient and regular deployments allow developers to make changes regulars that adhere to market demands.





Here is how we integrate the DevOps concept into the evaluation model:

DevOps		Trigger & Alignment
Plan	→	Objectives
Code, Build	→	Inputs
Test, Release, Deploy	→	Trigger
Operate	→	Outcomes
Monitor	→	Alignment

Objectives are the definition of interests of the collaboration. Input are like codes and the codes trigger outcome. The trigger section can track deteriorating actions.The alignment section of the model monitors the quality of the inputs and outcomes captures conflict of interest when they failed to fulfill the objectives. When ‘caught violations’ are captured, evaluators could refer to the

triggers and easily trace back to its root cause. The chain of inputs and outcomes involved can then be specifically extracted for further analysis.This alarms the collaborators and refrain them from repeating the same action so that a destructive chain reaction would be halted as soon as possible, replacing it by a revised input. This design for timely evaluation that prompts regular improvements is particularly useful for intermediate evaluations of long-term collaborations to keep things right on track.

Though long-term collaborations can differ in the type of work done throughout, the mission and main objectives would rarely change. Consistency of actions that correspond to the core mission is essential to an effective collaboration. By constantly emphasizing aligning inputs and outcomes with the objectives, evaluators will constantly keep their mission in mind. Managers could identify irrelevant inputs from outcomes that did not fulfill their objectives and remove such input from future plans while maintaining inputs that reap intended outcomes.

(C) Pharmaceutical Industry Overview Through 4 Perspectives

The growing attention towards healthcare is reflected in terms rising health expenditures. of In 2016, 10% of the world GDP was contributed to health expenditure compared to 9% a decade ago[6]. USA pharmaceutical expenditures in 2017 were $385 billion USD while China spent $123 billion USD. Moreover, according to Global Healthcare[7], a report released by Freedonia Focus Reports, global healthcare expenditures are expected to rise 3.7% annually through 2023. Regions with developing economies are estimated to have the strongest growth for example the Asia-Pacific region is predicted to experience nearly 6.0% annual rise.

Multiple trends are defining the modern healthcare system. There is a shift of focus from spontaneous treatments to systematic prevention to complete cures and the development of an increasing patient-oriented market approach. There are also higher demands in the society for performance-based pricing on drugs instead of the traditional 'pay-for-results' practices as well as calls for pricing transparency.

1. Customer Perspective

1.1. Aging population increase demands for pharmaceutical products

In 2019, there were 703 million people aged 65 or above in the world, which accounted for 9.3% of the global population. The rate of population ageing is accelerating as the number of elderly is anticipated to double to to 1.5 billion in 2050. By 2050, the elderly population above 65 years old will consists 16% of the total world population. One in six people will age 65 or above[8].

As global population ages, there are also increasing needs for medications, supplements and other healthcare services as health issues are very common among the aged. According to the Office of Disease Prevention and Health Promotion, over of 60% of people who are born between 1946 and 1964 will be managing more than one chronic conditions[9]. In U.S, chronic conditions account for $3.5 trillion in annual healthcare costs. Common chronic diseases include cardiovascular diseases, cancers and diabetes.

As long-term diseases patients often require intensive and continuous prescriptions or medical attention, it would be a valuable chance for the pharmaceutical industry to invest more resources in the seniors market by focusing drug development on treatments of chronic diseases.

1.2. Poor industry reputation among customers

The pharmaceutical industry has a damaged reputation among the public. Global healthcare is shifting to a patient-oriented approach, thus customer perceptions would be highly valued. Despite the emphasis and focus on good intentions and moral business practices, traditional malpractices such as monopolized drug costs and corporate greed had been deep-rooted in customers' perceptions, resulting to mistrust towards the industry.

According to a Gallup poll in 2018, American perception towards pharmaceutical business were the worst among the 25 businesses studied[10]. 58% of the participants held a negative view of the

industry while only 28% expressed positive regards.

A tarnished reputation could have deteriorating impacts. For instance, Monsanto became the well-known face of corporate evil after promoting worldwide use of potentially carcinogenic herbicide Roundup. In addition, Mylan's market value suffered from a 30% drop in 2016 when it was discovered that the company raised prices of a live-saving allergy treatment, EpiPens, by about 400% in 2010-2016[11].

2. Financial Perspective

2.1. Stricter government pricing policies

In recent years, as national medical expenditures soar, governments around the globe have increase the scale cost containment policies on pharmaceutical products. The 3 common class of policies are pricing control and cuts, reimbursement policies, and policies promoting generic medicines[12].

All member states of Organization of Economic Cooperation and Development (OECD) expect USA directly regulate pharmaceutical prices. In Japan and Philippines, there are mandatory annual price cuts. In Belgium and France, there are policies that provide incentive for physicians and patients to prescribe and receive generics respectively[12].

The pharmaceutical industry claim that price control policies have directly threaten pharmaceutical spendings and hinder research and development efforts. According to a study on OECD price controls impacts conducted by US Department of Commerce, it was noted that price controls could be linked to a $5-$8 billion USD reduction per year in global pharmaceutical spending resulting in 3-4 new molecular entities not being developed annually[12].

2.2. Expiring patents threaten profit growth

Patenting in the pharmaceutical industry is crucial in protecting profits. A company will have the exclusive rights to manufacture their patent product over a certain period of time which on average spans over 20 years until the patent expires. During this period, the owner company is render free from any competition on the specific drug and reaps all the revenue from its sale. For example, the 1983 Orphan Drug Act in the U.S. granted drugmakers who 'secured approval of a rare disease drug', 7 years of exclusive marketing rights[13].

Yet, due to expiring patents, worldwide sales of $17 billion USD are at risk as 18 drugs are losing patent protection or exclusivity in 2020[14]. Though the expected risk is comparatively much less than $41 billion USD of sales in 2019 and there may be additional patents protecting the same drug, cheaper generics could rapidly cut as much as 90% of sales once drugs lose patent protection[14]. The damage done is inevitable and immediate.

3. Internal Processes Perspective

3.1. Strict regulatory framework limits internal competition

Strict regulatory frameworks and high technical with employment requirements create high entry barriers for newcomers which results in lower threat of entry for existing companies.

The regulatory framework of the pharmaceutical industry is strict and complex consisting of governmental monitoring agencies and numerous drug-related laws concerning medication safety and advertising. Different countries have their respective regulatory agencies such as Food and Drug Administration of USA, National Medical Products Administration of China and Federal Institute for Drug and Medical Devices etc. Furthermore, the technical and financial requirements are exceptional high for pharmaceutical startups as drug development requires intensive professional talent and capital investment.

In 2018, the 10 largest pharmaceutical companies alone hold 41% of market share and 73% of worldwide prescription drug sales, indicating a rather monopolized market with restricted internal competition[15]. Though the Top 10 companies will gradually lose market share to others,they will still control a solid 35% of global market share.

Worldwide Prescription Drug Sales and Market Share (2018 VS 2024)

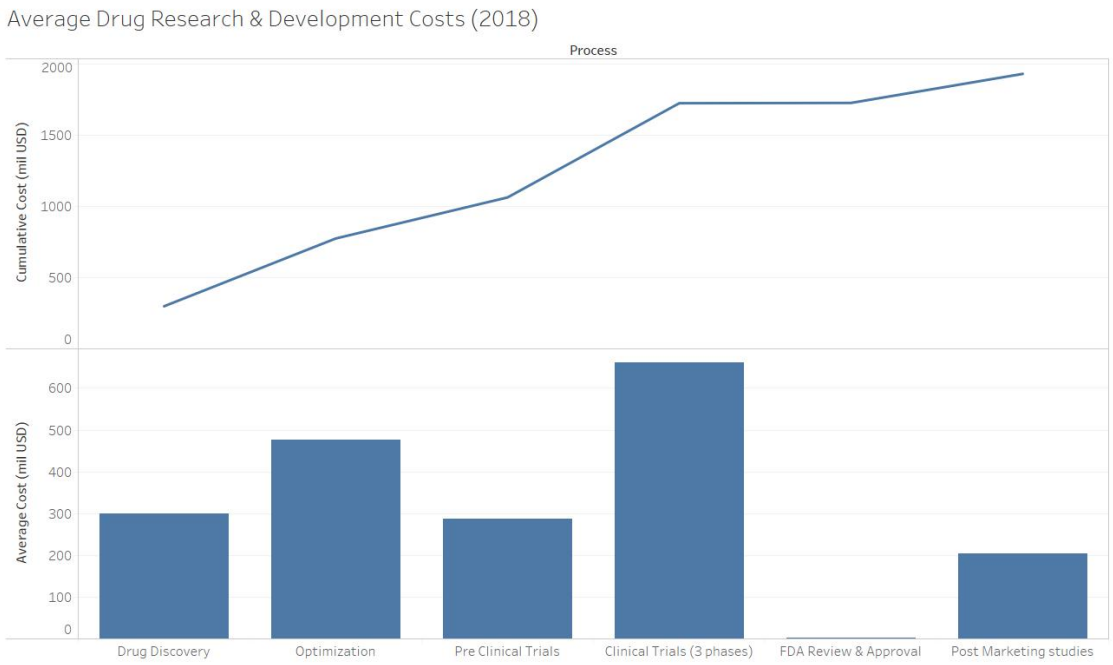
Company	Country	Worldwide Prescription Drug Sales (billion USD)		Worldwide Market Share (%)	
		2018	2024	2018	2024
Pfizer	USA	45.3	51.2	5.5%	4.3%

Roche	Switzerland	44.6	46.7	5.4%	4.0%
Novartis	Switzerland	43.5	49.8	5.3%	4.2%
Johnson & Johnson	USA	38.8	45.8	4.7%	3.9%
Merck & Co	USA	37.4	42.5	4.5%	3.6%
Sanofi	France	35.1	40.7	4.2%	3.4%
AbbVie	USA	32.1	35.0	3.9%	3.0%
GlaxoKlineSmith	UK	30.6	38.7	3.7%	3.3%
AstraZeneca	UK/ Sweden	20.7	32.2	2.5%	2.7%
Takeda	Japan	17.4	32.3	2.1%	2.7%
Top 10 Total		345.4	414.8	41.7%	35.1%
Others		482.3	766.0	58.3%	64.9%

3.2. High failure rates on costly and time consuming product development

It takes on average $2.6 billion USD and 10 years to introduced one new drug to the market. Yet, clinical success rate is disproportionately low, less than 12%[13].

The bio-pharmaceutical research and development process typically consists of the following processes[13]:



Average Cost And Time For Drug Research & Development (2018)

Process	Average Time (Years)	Average Cost (million USD)
Drug Discovery	Varied	299
Optimization		476
Pre-Clinical Trials	3	288
Clinical Trials (3 phases)	6.5	661.5

FDA Review and Approval	2	2
Post-Marketing Studies	Ongoing	204
Total	>11.5	1930.5
*Average final success rate: ~10%		

The complexity of details in the drug R&D processes also a huge burden to the industry's shortcomings. For instance, clinical trials development alone takes 6-7 years with additional months or even years to enroll volunteers and select those who meet the specific requirements. Enrollment processes had also evolved in complexity for example the length of the form used to collect patient data increased by 227% from 2000 to 2011[13]. In addition, applications for FDA review and approval of one drug alone can run over 100,000 pages[13].

4. Learning & Growth Perspective

4.1. Low productivity in innovation

Low productivity has been one of the most fundamental weaknesses and major concerns about the pharmaceutical industry. Both BBC and pwc pharma 2020 had addressed the issue of poor productivity. In the 2014 BBC article titled "Pharmaceuticals industry facing fundamental change'[16], interviewee Dr Kees de Joncheere at the World Health Organization mentioned that 'in the past 10-20 years there has been very little breakthrough in innovation'. In pwc's 'Pharma 2020' series[17], it was said that pharmaceutical outputs in the past decade remained stable yet productivity are less likely to increase if conventional discovery and development processes continue to dominate.

4.2. Technological advances improve company capabilities

Pharmaceutical companies can incorporate technological advances into product design and manufacture to produce innovative products efficiently. Through utilizing specific technologies, 3 pharmaceutical archetypes emerged: active portfolio company, virtual value chain orchestrator and niche specialists[18].

Instead of conventional general pharmaceutical giants, active portfolio companies are typically active in several therapeutic areas. The virtual chain orchestrators are the data owners and often act as the crucial link between supply and demand. The niche specialists are smaller in scale and are devoted to one single disease completely from prevention to real cure. Though company focus may have reduced in scale, sophistication of understanding towards specific diseases have substantially increase.

Moreover, joint ventures between pharmaceuticals and technology companies are raising the technological capabilities of pharmaceuticals. Companies are striving to incorporate software into healthcare products. For example, Varian Medical Systems and Flatiron Health aimed to develop a cloud-based software that contains electronic medical records and decision making functions targeted for oncology patients[18].

(D) Case Studies

Unsuccessful Pharmaceutical Buyer-Supplier Collaboration[19]

This collaboration between a pharmaceutical manufacturer (supplier) and its major distributor (buyer) was initiated in 2000. The companies collaborated in building a joint product supply chain of pharmaceutical products. This case study was an unsuccessful example of collaboration between drug suppliers and distributors and it had reflected some of common problems that lead to ineffective collaborative projects.

1. Background

Companies attempted to partner with supply chain members to raise their competitiveness through reduction of logistic costs and enhancement of delivery efficiency. The supplier and buyer companies in this case belonged to one enterprise group and had been partnering for over 14 years.

The supplier company was an Indonesian state-owned pharmaceutical manufacturer founded in 1918. Their main products were generic drugs, over the counter drugs and ethical drugs. The buyer company was an Indonesian state-owned distributor for pharmaceutical products. The company distributed the supplier's products through 31 branches to 1,264 hospitals, 505 government institutions as well as thousands of pharmacies and drug stores. 90% of the supplier's products were distributed by the buyer company while the supplier's products account for around 63% of the buyer's sales. In 2011-2012, both companies suffered from a drop in sales. Supplier's sales experienced a 4.2% drop from $120 million USD to $115 million USD. Buyer's sales suffered from a 11.3% drop from $115 million USD to $102 million USD.

2. Analysis of Collaboration Effectiveness

The collaboration was ineffective. Both companies suffered from financial losses from diminishing performances in sales. The partnership ended after 15 years due to diminishing performance for both collaborators and failure to strive for higher level of collaboration. Most problematic inputs were in the internal processes and learning & growth perspectives. The financial perspective suffered the most. The failure exposed shortcomings ranging from unsynchronized objectives to a lack of trust and communication between collaborators.

2.1. Contradicting inputs due to lack of common objectives

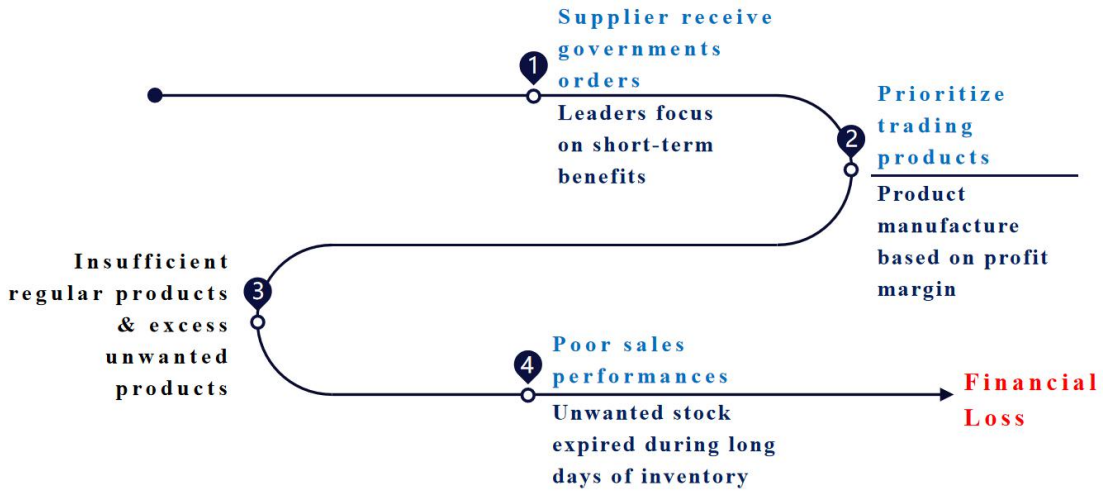
The collaborators in this case had engaged in a long collaboration spreading over 10 years. However, the collaborators did not agreed on a set of common objectives since initiation of the project. Inputs by collaborators were not planned to fulfill goals that benefit both sides and thus actions taken be one could have deteriorating impact on the other.

Malpractice of the supplier caused a chain reaction that led to a vicious cycle of high costs and poor sales performance. For instance, supplier produce products based on cluster but not real demand from the buyer. Conflicts occurred when products delivered by supplier were inconsistent with buyer's orders. To add on, supplier prioritize delivery for to fulfill government's orders so

that sometimes products were withdrawn from the regular supply. The buyer suffered from the supplier's actions. Buyer could not complete regular customers' orders as supply for required products were constantly insufficient, resulting in low purchase order fulfillment at only around 72% in 2011. Buyer also suffered from profit-growth decline from the constant supply of unwanted products due to cluster-based production. Product return was high, accounting for 14% of sales in 2011. Unwanted products were stored for long days in inventory. Since the buyer had 31 distribution branches, the cumulative storage costs from all the branches posed unnecessarily large financial burden. A large batch of unwanted pharmaceutical products expired in inventory. Expired products must not be sold, further dragging down profit growth. In 2011, the value of expired products were $402 million USD.

The root causes identified for the failure of this collaboration were production based on profit margin not real demand and prioritizing trading products over regular products. Both were actions done by the supplier that contradicted buyer's interests and operational schedule, leading to diminishing sales performance for both sides. The root problems could be avoided if the collaborators synchronized their production planning according to common objectives that protect interests of both of them.

Causal Relationship Diagram:



2.2. Unsuitable leadership

Leadership that did not favour collaboration was another factor that resulted in ineffective collaboration. Leaders of the companies were skeptical about the benefits of collaboration and did little to foster communication and pursue a closer relationship. Without adequate communication, the companies could not coordinate their actions nor establish trust. They failed to attain a state of synergy which ultimately made their partnership ineffective.

In an interview, the Senior Manager of Operations of the buyer stated that the companies were 'a different entity' and did not want to disclose information. The collaborators refrained from linking their information technology together though both had high information and technology

capabilities and thus essential trust between partners were weak. This was reflected from a survey measuring the degree of collaboration. The score for risks and benefits sharing was the lowest, 3.15 out of 5.

In this long-term partnership, the leader of the supplier focused on short-term benefits and prioritize products that generated most profit. Customer demands were neglected. Not only did this disrupted regular operational schedule of the buyer, company reputation was also jeopardized for failing to satisfy customers. As benefits of one side was achieved at the expense of risking collaborators benefits, ineffectiveness in the buyer's operations eventually eroded suppliers' interests as well.

Employees also reflected that top executives lack clear long-term vision and commitment to the partnership. Some mentioned that 'our decision maker does not consider it (collaboration policy) as urgent'. Coordination was inconsistent from top-down as 'coordination activities were left to respective functional areas'. Lack of enthusiasm from company leaders encouraged discouraged employees to devote efforts wholeheartedly on the partnership and strive for better performances.

3. Case Conclusion

To conclude, the buyer-supplier partnership demonstrated the fatal flaws that would deteriorate the effectiveness of a collaboration. Leaders were not committed in the long-term partnership lack top management vision. Uncoordinated inputs resulting from insufficient communication and information sharing triggered undesirable outcomes such as poor sales performance and financial loss. Collaboration must not be effective if collaborators only cared for their own benefits and neglect the fact the partners in collaboration were symbiotic.

Lilly MDR-TB Partnership: Effective Philanthropic collaboration Against MDR-TB

The MDR-TB (Multi drug resistant tuberculosis) Partnership initiated in 2003 was a non-profit multilateral collaboration with a mission to combat the growing MDR-TB pandemic and to support the Global Plan to stop TB (Tuberculosis). This case study was a successful example of how pharmaceutical companies could manifest social corporate responsibility by focusing on patient wellbeing and contributing to combating global pandemic. Elements of the collaboration had responded to the current industry dynamics, proving it a valuable reference.

Dynamic	Responding input/ outcome from the case
➢ Financial perspective: patent expiration threaten revenue	➢ Expansion of therapeutic portfolio though open innovation projects (TBDDI) ➢ Technology transfer to extend value of off-patent products
➢ Customer perspective: poor industry reputation among customers	➢ Philanthropic approach to collaboration ➢ Subsidize the medicine for short term and built local capacity and capability for treatment to manifest corporate social responsibility
➢ Internal processes perspective: high failure rates on costly and time consuming product development	➢ Public-private partnership nature of TBDDI increase collaborators to willingness to share risks and benefits ➢ Sharing compound libraries and research tools to increase efficiency for compound screening for identification of new clinical candidates
➢ Learning & growth perspective: low productivity in innovation	➢ Co-developing compounds with the Initiative (TBBDI) or contributing research tools for TBDDI in exchange for additional data and resources sponsored by National Institute of Health (NIH)

The comprehensive collaboration spread across financial investments, drug discovery, technology transfer and professional training in high-burdened countries. Actors involved could be categorized into 3 groups: Eli Lilly, the partner organizations and high-burdened countries (China, India, Russia, South Africa).

List of partner organizations[20]	
1. Akorn,USA	11. Purdue University, USA
2. Aspen Pharmacare, South Africa	12. Shasun Chemicals and Drugs, India
3. Cause Premiere	13. SIA International/ Biocom, Russia
4. Global Business Coalition (GBC)	14. Stop TB Partnership
5. Global Health Advocates (GHA)	15. TB Alert
6. Harvard Medical Schools and Partners in Health (PIH)	16. The Advocacy Partnership
7. Hisun Pharmaceutical, China	17. U.S. Centers for Disease Control and Prevention (CDC)
8. International Fed. of Red Cross and Red Cresent Societies (IFRC)	18. Vianex S.A.
9. International Hospital Federation (IHF)	19. World Economic Forum (WEF)
10. RESULTS Educational Fund	20. World Health Organization (WHO)
	21. World Medical Association (WMA)

1. Background

Eli Lilly and Company was founded in 1876 in USA and has became one the top pharmaceutical companies globally. Eli Lilly is the largest producer and distributor of psychiatric medications, such as Prozac in the world. Yet, the pharmaceutical giant suffered from financial loss of $36.8 billion USD due to patent expiration of best-selling product, Prozac, in 1980s[21].

During 1990s and early 2000s, Eli Lilly was also phasing out off-patent antibiotics, capreomycin and cycloserine, which were second-line drug for TB[22]. With soaring cases of MDR-TB, there would be growing demand for the drugs in certain areas though it might not be profitable for the company. Therefore, the company adopted a philanthropic approach and introduced the Lilly MDR-TB Partnership in 2003. Eli Lilly would subsidize the medicine for short term and built local capacity and capability for TB treatment in the long run. To add on, the company attempted to use open innovation initiatives to raise R&D productivity and diversify core therapeutic areas. TBDDI (Tuberculosis drug discovery initiative) launched in 2007 funded under the Lilly MDR-TB partnership were public-private partnerships to develop new TB drugs[21].

2. Analysis of Collaboration Effectiveness

The collaboration was effective to a large extent. Inputs at different perspective have yield outcomes that align to objectives at the same or across perspectives. Positive outcomes were reported by aid-receivers. The collaboration benefited not only the aid-receivers but also those who input resources though benefits were not immediately presented as a direct outcome of their inputs. Nevertheless, there are shortcomings concerning end drug prices due to uncontrollable factors

2.1. Synchronized goals and actions

The collaboration had a central mission 'to combat the growing MDR-TB pandemic and to support the Global Plan to stop TB'[20]. This formed the necessary foundation for the partnership. Objectives at each perspective all contributed to achieving the mission:

Mission: To combat the growing MDR-TB pandemic and to support the Global Plan to Stop TB	
Patient perspective	1. Access to quality and affordable MDR-TB drug supply 2. Fulfilling community needs in primary care
Financial perspective	1. Lowering drug manufacturing costs
Internal processes perspective	1. Accelerate early-stage drug discovery 2. Moving manufacturing closer to patients with urgent needs
Learning & growth perspective	1. Improve healthcare provision quality

Though each actor had their respective area of expertise and interests, they had agreed on a set of common goals to be adhered throughout the collaboration. The central mission defined the criteria of actions taken and a universal standard for actors to plan and evaluate their planning against. For instance as shown in the master map, inputs are made to target objectives mentioned, thus outcomes yielded could fulfill respective objectives precisely.

To add on, synergetic actions of different actors complemented each other which leveraged the effectiveness of the collaboration. For instance, with reference to Grey: Technology transfer from Eli Lilly to high-burdened countries, Eli Lilly initiated technology transfer on drug manufacture in the internal processes perspective. While in the learning & growth perspective, partner organization, Purdue University in this case, contributed to providing training in manufacturing and good business practices[20]. Purdue's training complemented Eli Lilly's technology transfer leading to a high quality local drug manufacturing which aligned to objectives across patient and internal processes perspectives.

2.2. Objective fulfillment across perspectives and mutual empowerment

In this collaboration, some inputs within one perspective not only contributed objectives within perspective but also across perspectives.

For example, in Grey: Technology transfer from Eli Lilly to high-burdened countries, technology transfer on drug manufacture by Eli Lilly resulted not only in the establishment of local manufacturing plants, but also creation of employment opportunities and reduction in final API (active pharmaceutical ingredient) costs. The outcomes from one input aligned to multiple objectives across perspectives.

Moreover, inputs of actors compensated for others' weakness and empowered their collaborators. Thus, the collaboration could be deemed effective as all parties were able to benefit from their combined efforts.

For instance, in Green: improving local healthcare provision, inputs by partner organizations in the learning & growth perspective strengthened the healthcare provision quality and improve fulfillment of community needs in primary care. Partner organizations initiated healthcare professional education program and advocacy programs. This resulted in the training of 19,000 nurses, 1,000 physicians and 300 hospital managers[20]. In India, patients received more efficient TB testing and treatment[23]. In Voronezh, Russia, implementation of rapid diagnosis MDR-TB

strategies significantly shortened time for MDR-TB patient identification[23]. Efforts of partner organizations strengthened the capacity and capability of high-burdened countries to curb local TB situation so that these countries could make a greater progress in combating the growing MDR-TB pandemic at its core.

2.3. From short-term goals to sustainable achievements

The mission to combat the growing MDR-TB pandemic would be a continuous battle even if the partnership ended. Thus, sustainability of desirable outcomes is also one of the important parameters of evaluating effectiveness of this collaboration. The Lilly MDR-TB Partnership had effectively extended achievements in the partnership initiatives into sustainable practices at each perspective.

In terms of drug discovery, Eli Lilly invested $20 million and later an additional $15 million USD into TBDDI[21]. The company's compound library and research tools were made available to program members. The initiative instantly increased efficiency for compound screening for identification for new clinical candidates. The practice of sharing compound libraries among collaborators broke away from traditional siloed R&D practices and was further pursued when TBDDI integrated with a larger collaborative project, TB Drug Accelerator (TBDA)[21].

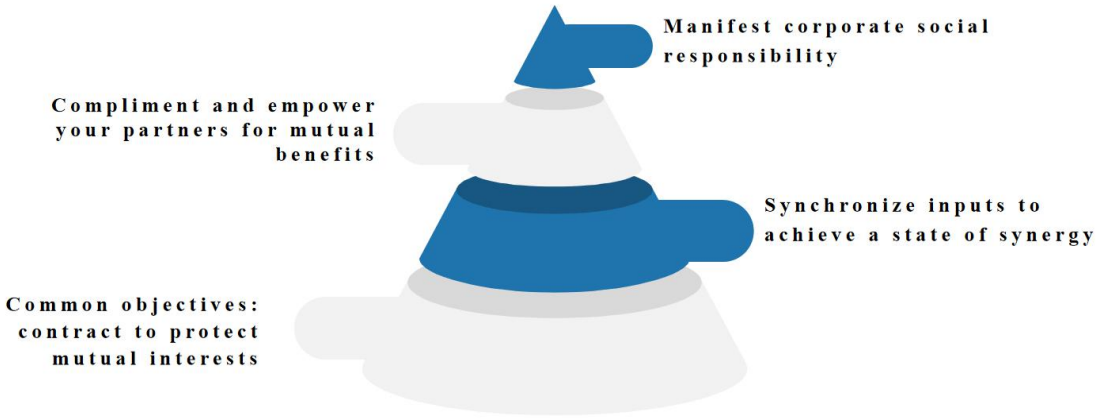
In addition, Eli Lilly proceeded from financial subsidizing TB drugs to localization of the manufacturing system by transferring know-how to local manufacturers[22]. This resulted in independent self-sustainable drug production even if Eli Lilly withdrew financial subsidies. The act of technology transfer provided insight into how pharmaceuticals could create value from off-patent technologies and fulfill their social corporate responsibility.

3. Case Conclusion

To conclude, the Eli Lilly MDR-TB Partnership demonstrated the elements necessary for an effective collaboration applicable in the current context. the partnership was an effective collaboration as it was built from a stable foundation of synchronized goals and actions. Actors' input complemented each others' actions so that synergetic efforts fulfilled objectives within and across perspectives with precision. Corporate social responsibility was manifested from empowerment of high-burdened countries though subsidies for living-saving medicines and technology transfer. The collaboration also extended short-term goals into sustainable practices that would continue contributed towards the core missions even the project ended.

(E) Conclusion

The Balanced Entry Strategy Map provides a framework for an all-rounded systematic evaluation of the effectiveness of collaborations in the pharmaceutical industry. The framework takes in account 4 perspectives: customer, financial, internal processes and learning & growth so that collaborators can map out causal relationships across operational levels. The integration of DevOps concepts enables timely evaluation that prompts regular improvements. Collaborators should constantly align their inputs to common objectives to ensure that the mission can be achieve. This is the key to maintain consistency in long-term collaborations.



By analyzing two case studies, we can identify two elements crucial to an effective collaboration. The definition of common objectives set the guiding principles for the partnership and act as the contract that protects collaborators interests. Inputs from collaborators can be synchronized under a mutually agreed mission and yield desirable outcomes in synergy with with precision. In addition, collaborators' inputs should compliment each other and avoid benefiting at the expense of their partners' sufferings. Partners in a collaboration are more than separate entities. In this symbiotic relationship, neglecting your collaborators wellbeing would ultimately drag the whole collaboration down.

Businesses should engage for collaborations not only for improving companies operations but also for the benefit of their customers. Manifestation of corporate social responsibility will the focus in order to achieve sustainable development.

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Appendix: Reflection on the 2020 GIS Course

If I were to use 2 words to conclude this course, it would be discovery and challenge.

During this course, I encountered concepts such as Kuhn's Cycle, paradigm shift, Web 3.0 and git, which I was unfamiliar with. Though it was a bit overwhelming learning about these distant vocabulary at first, I was excited to explore the new realms of knowledge. Previously, the term 'innovation' sounded vague to me. From the lecture, I was taught how great people achieve innovation. To add on, the course opened up a new perspective for me to understand how the world works with the massive support from softwares and programming through exposure to literature with inspiring ideas.

This course was challenging in terms of mentality and skill. During the lessons, I was presented with questions that I have never thought of and this has stimulated me to try thinking of the the box. While I was constructing the Balanced Entry Strategy Map, I encountered difficulties on the design and utility of model. I initially dealt with problems each at a time yet different problems arise one after the other. Thus, I tried thinking forward and improve the model not only to tackle existing weaknesses but to prevent future loopholes as well. In terms of skill, this course polished my writing skills so that I could with more clarity and precision. Through doing the industry analysis report, I got to explore