



MODEL OF PHYSICIAN DECISION MAKING PROCESS ON PRESCRIBING PRESCRIPTION DRUGS IN INDONESIA

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Abstract

Physician decision on prescribing drugs is an essential factor to curing of patients. The role of the doctor is very dominant in Indonesia. Patients do not know the type, category and brand name of drugs prescribed remedy will cure the disease. Although there are regulations on the pharmaceutical business but in practice enforcement is still weak. The research aims to analyze internal and external factors influencing doctor's to prescribe drugs. The study uses descriptive and quantitative statistical methods involving 160 physicians of which Structural Equation Model is used to verify linkages between factors. The interesting findings of the research is that physician's decision revealed as a complex decision and established a balance process among variable or factors affecting the decision making process. Diagnosis result, business factors, internal factors having an effect negatively on the decision to prescribe the drug. Regulation and patient economical condition positive influence. The result contribute to the knowledge of physician decision making, government have to improve the physician welfare and the pharmaceutical industry should designing proper marketing strategy to utilize of scientific approach instead of commercial approach.

Keywords: Physician Decision Making, Pharmaceutical Industry, Prescription Drugs, SEM.

1. Introduction

Commercial interest in Indonesia's healthcare sector will accelerate over the course of 2014, the year that marks the introduction of universal health insurance. The programme is expected to offer numerous opportunities for drugmakers, medical device manufacturers and providers of medical services. Companies that already have a presence in the South East Asian country will have a distinct advantage over new entrants. We note that the significant expansion of medical services in recent years has been facilitated by Indonesia's steady economic growth and relative political stability, although operational risks in the shape of factors such as red tape and legal framework remain present.

According to Business Monitor International (BMI) Q2 2013 reported, Indonesia Pharmaceutical market sales has shown with US\$ 6.24 bn in 2012 to

US\$ 6.54 bn in 2013 means the sales turnover growth 4.9%. Forecast broadly unchanged from previous quarter. Healthcare sector also increasing from US\$ 21.33 bn in 2012 to US\$ 22.38 bn in 2013, or growth 4.9%.

The rising health care cost due to increased awareness about health and the pressures of work so that emerging diseases such as stress due to pressure of work, lack of exercise and the emergence of psychic illness. New disease or disease variation from the existing are caused by various reasons. Modern and global lifestyle has resulted in people to suffer from certain disease. So is, the middle class has more concern on health standard which is made possible by better income.

Gonul *et al.* (2001) states that strategy of pharmaceutical marketing is different from other business. In this business sector, physician plays very important role, they determine products to be



prescribed to the user, whereas other products are determined mostly by end users. In other words, pharmaceutical business has indirect interaction with end users or patients through physician. Therefore, physician roles in providing service to patients are located in central part of the interaction in which patients as the final consumers cannot be fully involved in the drugs prescription decision making. Decision to the drugs prescription is influenced by many factors such as promotion of pharmaceutical companies, regulation, patient buying power, drugs stocks and other factors either direct or indirect ones.

Based on medicine availability, prescription drugs is categorized into generic medicine, branded generic medicine (me-too) or branded generic and patented medicine. The difference of the their availability can be seen from the perspective of price, promotion method and brand related ownership. Patented drug is ones with trade name which is owned by the producer of the drugs such as Ventolin (Glaxo) and Lipitor (Pfizer). Generic drugs having brand (me-too) is generic drug made after the patent period obsolete. Generic drugs is one having active ingredients as accordance to generic name as seen in salbutamol which mean a drug made from salbutamol active substance. This is then sell out as Salbutamol.

The physician experts in the world has provided with a guideline on selecting drugs to a disease. The guideline is made to assist physician in undertaking their roles. Cabana *et al.* (1999) investigated in a research regarding physician behavior in giving prescription showed that most of them did not follow medical procedure or the guideline, causing reasons are lack of information, inadequate time, and reluctance to change from their routines. Philip (2001) and Alvanso *et al.* (2003) found many physicians were being irrational during prescribing drugs in which the decision is based on promotion effects and personal judgement referring to attitude and behavior. Bathia (2006) explained that KOL (Key Opinion Leader) has profound influence during physician prescription pattern. The safe, accurate and rational drug affects curing process. Whilst, with a substantial increase in drugs choices will increase difficulty in selecting correct drug. Lack of knowledge on pharmacologist regarding new drugs and free attitude of physician in selecting drugs cause different 'taste'. In addition to that, drug promotion driven by sales target has pushed overconsumption of drugs which are irrational and give negative effects to drug users.

Review over physical behaviour during drugs prescription, relationship between physician and pharmaceutical company, as well as patients roles in decision making on the drugs prescription are definitely an interested issue as mentioned by Frank (2004) that relationship of patient and physician is an interesting topic in health economic theme. Pharmaceutical and physician as quoted by Susan (2002) has common interests in progressing medical knowledge. Nonetheless, the prime ethic of physician is to provide the best needs for patients, whilst the main industrial ethic is to get profit maximally. Christina (2005) states that interaction between physician and drugs companies have to be within acceptable boundaries.

There are many research on the physician decision making process. Ching (2008) examines roles of detailing in the physician decision making whereas Narayan *et al.* (2004) focuses on behaviour during the prescription by physician as influenced by drugs quality and physician responses toward marketing practice of the pharmaceutical companies (Manchanda and Chintagunta 2004, Mizik *et al.* 2004). In making prescription, there are two important factors which are internal and external ones. Internal factor is factors as believed by an individual who are sure that they can control their objective because of their internal capability in writing the prescription. External factors are ones affect an individual who is sure that internal process is affected from external forces.

Problem Formulation

Regulation in Indonesia prohibits promotion of prescription drugs to the patient directly, resulting in asymmetry of information about the drug among patients and physicians. The role of the doctor is very dominant. Patients do not know the type, category and brand drugs prescribed remedy will cure the disease. Although there are regulations on the pharmaceutical business but in practice enforcement is still weak. The development of the pharmaceutical companies in the last decade is running very fast, a lot of new companies that enliven the market. Most of them produce a product that is similar to the old company. This condition give rise to unfair competition. Every company is try to convince the doctors and do everything for doctors to prescribe their products, sometimes breaking out of existing regulation. This situation, of course, would be detrimental to the patient and will encourage



competition among the pharmaceutical industry becomes increasingly unfair.

Taking into account the above conditions, how the process of decision making by physicians in prescribing the drug, how much influence the pharmaceutical industry as well as other factors influencing physician decision making.

Research Objectives

This research in general aims to comprehend factors involved in physician decision process to prescribe drugs in Indonesia. In particular, it investigates how strong influence and interaction between factors as well as implication that might occur in relation to the making of that decision. Based on above explanation as well as identification and frame of thought, the specific objectives of the research are:

- 1) To analyze internal and external factors influencing doctor's to prescribe prescription drugs
- 2) To develop a new model of physician decision making to prescribe prescription drugs

2. Literature Review

Pharmaceutical Marketing

Marketing is a process of developing business and adjusting its proposition to necessity and demand of a market which constantly changes. Kotler and Armstrong (2012) defined marketing as a company process to create values to customers and make strong relationships with customers in order to get values from the customers as returns. The marketing consists of five steps as follows: 1) understand needs and desires of customers, 2) design strategy to get, maintain and improve targeted customers, 3) develop marketing program, 4) collect the results. Marketing mix is, in general, a term used to describe the four combination structuring marketing system of an organization. These are product/service offered, price structure, promotion activities, and distribution.

Dickov (2011) stated that pharmaceutical market is a complex system in which a number of stakeholders put their interests. Product diversities and geographical coverage push companies to establish their strategy in an individual level. This relates to Noris *et al.* (2005), Rollins and Perry (2014) mentioned that pharmaceutical marketing is

different from general other market. The market is comprised of doctors who are legally entitled to make prescriptions and patients as the final consumers of the pharmaceutical industry. Drugs are sold indirectly in which the final users (patients) has to buy the products from doctors. Reasons differentiating drugs and other kind of products are as follows: 1) serious consequence to health by which the decision to buy shall be done by doctors and 2) there are not one product considered as the best one as their curing effectiveness vary from patient to patient.

The marketing perspective on pharmaceutical as accordance to Vasiljev S and Pantelic D (2010) is capability of pharmaceutical companies in comprehending their customers organization and work to meet the costumers needs efficiently. According to Bathia *et al.* (2006), pharmaceutical marketing for prescribed drugs is not the same with other products as regards to two aspects. These are firstly, serious consequence and side effects of incorrect prescribed drugs by which legally and professionally it is doctor or physician allowed to select the product. Secondly, there are not any best quality of drugs as their effectiveness vary to patients factors. As a consequence, patient characteristics, history of medication and comorbidity are important factors in selecting drugs to patients.

Promotion of Prescription Drugs

Promotion of ethical drugs in Indonesia is regulated based on Decree of Indoensian FDA (BPOM) Head Number HK.00.05.3.02706 year 2002 regarding Drugs promotion. Other applicable legislations are 1) WHO (World Health Organization) in 1988 issued Ethical Criteria for Medicinal Drug Promotion; 2) IPMG (International Pharmaceuticals Manufacturers Group) mandated its member pharmaceutical companies to follow IPMG Code of Pharmaceutical Marketing Practices; 3) GP Farmasi Indonesia (Indonesia Pharmaceutical Association) develop and apply "Code of conduct" focus on prescription drugs in 2003.

According that those rules, promotion of ethical drugs can be done as follows: 1) detailing to doctors and pharmacist by medical representative, 2) mailing brochure and literature to doctors or pharmacist, 3) advertisement in health medicine or medical journal; 4) symposium, 5) medical exhibition, 6) clinical meeting, and 7) public relation campaign. On the other hand, the companies are not



allowed to give drugs sample. As well, it can be seen that out of the seven methods, verbal information provided by the medical representatives are the most effective marketing practice.

The conduct of medical representative (MR) should include: providing accurate, correct and balance information; comprehend the scientific and economical element of drugs; and follow ethical code of ethical product marketing. The regulation has clearly stated that the MR cannot offer inducement, gift, incentive, donation, financial and other similar forms to doctors, pharmacist and pharmacy.

Physician Behaviours

The behaviour of doctors or physician in prescribing drugs is a hybrid process or combination of buying in industrial situation and buying in consumer level. Liu (1995) characterizes drug prescription as industrial purchase and free drugs selling or OTC (over the counter). The doctors decision on prescription has both properties. Despite scientific reasons used to make prescription, personal and social value play important roles, in particular on the prescription of treating disease by alternative drugs.

CPSO (2008) states that professional behaviour and good clinical skills are both important components of physician performance. Medical professionalism includes both the relationship between a physician and a patient and a social contract between physicians and society. A physician's professional responsibilities include the following: Responsibilities to the Patient. The physician's primary responsibility is to act in the best interests of the individual patient. This includes acting respectfully toward patients and their families, friends and visitors, even under stressful situations. Responsibilities to Other Members of the Health Care Team To promote the safe and efficient delivery of health care to all, physicians are expected to work respectfully and collaboratively with other members of the health care team. This includes other physicians, hospital staff, volunteers, students, and all other individuals who contribute to health care delivery. Responsibilities to Uphold the Standards of the Profession Physicians have a responsibility to the medical profession to behave in a professional and appropriate manner.

Decision Making

Moven and Minor (2002) mentioned that the most complex human decision is comprised of five stages: introducing, seeking, alternative evaluation, selection and evaluation post accusation. In introduction stage, consumer confess that they need something. This is encouraged by undertaking promotion. If the needs are strong, promotion will motivate the prospected buyers to enter second stage namely information seeking which is limited from the consumers involvement. In third stage, customers will do alternative evaluation to solve the problem. This is followed by action to consume and use the product or service. The generic decision making is applied in business, organization as well as individual. According to Sumarwan (2012) the framework of thought of consumers is often called as a decision model. Consumer decision making process in purchasing or consuming product or service are affected from three factors: a) marketing actions as done by producer and other institution, b) difference factors of individu, c) environmental factors of consumers.

In health areas, decision making reach to wide terms which can be applied to process to select between some choices to get cure. Thomas (1991) mentioned that clinical decision making of medical personnel is a decision considered as a complex one. Decision made that is not only for a personal but originated from limited choices. Medical team have to make decision on various consideration including diagnosis, intervention, interaction and evaluation within a dynamic context by using knowledge foundation. The knowledge include literature used as a foundation of involved variable and individual.

According Vries *et al.* (1994) there are six steps in the writing of prescriptions that define the patient's problem, determine treatment, verifying the suitability of the drug for patients, write prescriptions, provide information to patients about medications prescribed by explaining the appropriate instructions and warnings on the drugs that exist, and do monitoring. Chapman (2004) found that clinical decision making generally involves decision making process of health practitioners acting on behalf of patients.

Furthermore, Edwards *et al.* (2004) stressed out that clinical decision making is a result from collaboration process involving patient and professional team of health sectors. So, the decision has to have considered the patient decision. Orasanu

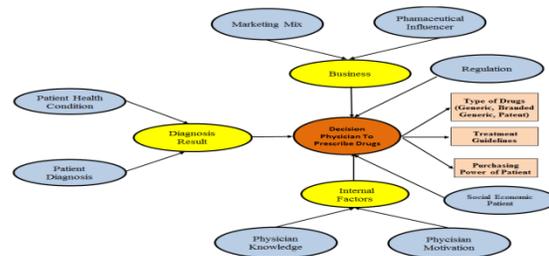
and Connolly (1993) explained that characteristics of decision making in dynamic situation just alike decision in health action which has to see the following 1) Commonly, the problems are unstructured with incomplete information and an interaction with several objectives, 2) Environment in decision making is uncertain and may change when a decision is made as well as the objective can change, 3) The decision made has effect to action and inputs from the action that can be information, 4) Decision contains pressures from time and individual, which affect strongly to all people, 5) Many parties play their own roles and purposes, 6) There are norms and purposes of organization, which affect the decision made.

3. Conceptual Thinking

As explained above, ethical product is sold indirectly as the pharmaceutical industry can not sell their product directly to patients or the selling is based on physician prescription as required by regulations. In pharmaceutical business, at least there are six important pillars, which are patient, physician, pharmacy, hospital, regulation and pharmaceutical company. In market, there are various name and types of drugs in which this is categorized into generic, generic branded, and patented drugs. The most differences among that products is price. High number of pharmaceutical companies operating in Indonesia creates unhealthy competition between companies during promotion.

The competition then occurs in the doctor's premises. As known that doctors have central and essential roles in selecting drugs to patients. This is because, in Indonesia, patient involvement in drug selection is low as the decision is entirely at doctors'. This situation creates possibilities of misconduct of doctors relating to professional and ethical codes. The applicable regulations have not been able to control doctors' attitudes and pharmaceutical companies to break the codes. The research is expected to uncover phenomena in drug sales regarding prescription process of physician, decision making of physician to select drug to patients, and as interaction between patient, physician and pharmaceutical companies. The framework of thought is presented in the following figure 1.

Figure1. Conceptual Research Model



From the above model can be describe as follow :

Diagnosis , internal factors , business factors , regulatory and economic conditions of the patient together will influence the process of prescribing drugs by doctors . The diagnosis is a process of continuous observations of health complaints by patients about their pain they felt and direct observation of the patient .

Business factors is a reflection of the marketing mix and the influence of the pharmaceutical industry, interactions between physicians and pharmaceutical companies through promotional programs conducted by medical sales representatives woke mutual relationship of mutual benefit of both parties that the pharmaceutical companies and doctors then create the business relationship.

Doctors also as a human beings who are also as social being, even they have knowledge but as a human they have motivation to do something. He or she have such desires to be rich person, also always get the respect different among different social classes would cause problem in their prof result in an internal factor that will influence their decision making process in prescribing drugs to the patients.

4. Methodology

The population is physician who active practices in Jakarta, Bogor, Tangerang, Depok and Bekasi from various specialist. The total number population of physician in that area is 5400 person. The sampling element is physician. Sampling unit is a physician. Sampling frame is list of physician in the above location. The total sampel is 160 doctor with various specialisation. The design of a study is face-to-face interview technique using a questionnaire.



The sampling technique that usage is selective purposive sampling.

Measurement scale used is Likert scale at 5 (five) points, of which score 1 is defined as Very disagree (Very bad), score 2 as Dissagree (Bad), score 3 as Neutral, score 4 as Agree (Good) and score 5 as Very agree (Very good).

The definition of the research variabel is as follows:

Patient health condition is a measure of patient condition during the visit to physician premise. In this research, patient condition latent consists of 2 (two) indicators: I will listen any explanation clinical details from patient (X1), I will check, note and make some 'assumption' of diagnosis possibilities (X2).

Disease diagnosis is determining the attacking disease by examining symptom and use laboratory report, photographs, as well as comparing other clinical signs. It consists of 3 (three) factors: Always read patient history in diagnosing disease (X3), physical examination using seeing, hearing, touching and sometimes by smelling (X4), Always use laboratory and medical image to ensure diagnose (X5).

Marketing Mix is the four components of marketing mix, which consists of Product, Price, Place and Promotion. It is grouped into 4 (four) indicators: drugs price as important factor in prescribing (X6), Drugs brand as important factors (X7), Promotion provided by supplier as important factors (X8), and drugs availability as important factors (X9).

Knowledge of doctor is comprehension to facts, information, description, or skills, which are collected from experience and or education. It consists of 5 (five) indicators: Consider the drug effectiveness (X10), Using previous experience in prescribing drugs to next patient (X11), Consider physician colleagues in prescribing drugs (X12), Consider pharmaceutical companies in prescribing drugs (X13), Attend scientific seminar and use associate knowledge from the seminar in prescribing drugs (X14).

Motivation of doctor is reasons from which an individual carries out an action. It consists of 3 (three) indicators: prescribe drugs to help patient and happy to do it (X15), prescribe drugs to prove commitment to pharmaceutical companies which have support to go to seminar (X16), prescribe drugs on the basis of humanity and ethical (X17)

Influncer of pharmaceutical industry is anything related to profession which apply skills in pharmaceutical areas of which it give effect to the decision process of drugs prescription. It consists of 5 (five) factors: consider emotional relationship with sales representatives (X18), Cooperate with pharmaceutical companies in giving the best service to patient (X19), Consider support (travelling related) that has been provided from pharmaceutidal companies (X20), Consider more on pharmaceutical companies rather than whoever visiting sales representatives (X21), Consider origin of the pharmaceutical companies as important factors (X22)

Regulation is regulations are rules made by governments, associations or institutions that should be followed by its members for the purpose of the best. It consist of 3 (three) factors: difficulty in making prescription due to an obligation to meet predetermined drugs list (X23), As doctors are restricted in accordance oath of professional ethics (X24), Difficulties in making prescription due to limitation of drugs uses based on quota to insurance participants (X25);

Patient Economical condition is the economical level of the patient as seen from visual appearance of the visiting patients. It consists of factors: appearance of the patients affects in prescribing drugs (X27), Talking gesture of the patients affects in prescribing drugs (X28), Job or profession of the patients affects in prescribing drugs (X29);

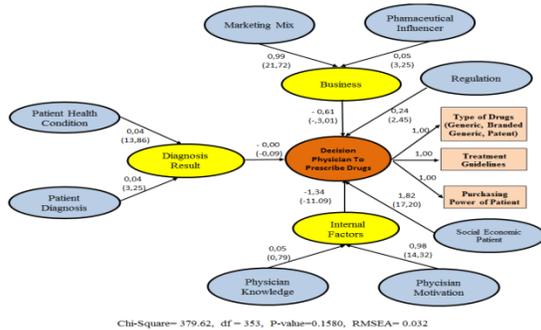
Prescribing drugs is a final decision making process in drugs prescription by considering factors including drugs types choices (generic, branded generic and patent), applicable guideline and buying power of patients. The factors are noted as drugs types (Y1), Treatment guideline or medication protocol (Y2) and patient buying power (Y3).

The research uses descriptive *Structural Equation Model* (SEM) which functions to test the statistical model as depicted in Figure 3. SEM analysis is an analysis based on Confirmatory Factor Analysis (CFA), a method that combines correlation analysis, regression analysis, traffic analysis and factor analysis (Suharjo, 2007). Figure 2. Structural and Measurement Model consisting of exogenous variable called Result of Diagnosis, Business, Regulation, Patient Economical Condition, Internal Factor of Doctor and Endogenous variable, which is Physician Decision to Precribe Drugs.



used to analyze test results of the measurement model and the structural model. The test results can be seen in Figure 3 below.

Figure 3. Hypotesis Tested Result



The test result to the model yields P-value = 0,1580 (< 0.05) and RMSEA = 0.032 (< 0.08). This means that overall empirical model can be adopted as accordance with the criteria set by Joreskog et al. (1996). Since it is accepted statistically, therefore model coefficient can be used as estimator of contributing value or effect of exogenous latent to endogenous latent variable.

The testing of coefficient reveals that model coefficient can be used to estimate contribution value or effects of exogenous latent variable to endogenous latent variable. With this result, the structural model show relationship patters of all latent variable and effects weight. The research suggests that decisions in prescribing drugs are affected by five latent variables which are diagnose result, business factors, regulations, patient economical condition and Internal motivation. The five variable works simultanously of which the phenomenon is seen as a whole interaction scheme as well as individual relationship.

Negative coefficient of relationship between diagnose result and drugs prescription decision because when a physician make a decision to prescribe drugs do not consider it but he or she considers more on regulation and patient economical condition. Therefore, roles of regulation and patient economical condition which is positive to decision to prescribe drugs does not affect automatically and linearly to drugs decision. The reason is that if the patient economical condition is in linear relationship to decision to prescribe drugs means rich patient will always get expensive drugs, whilst poor patients will get cheap drugs since there is factor of business and physician motivation which give negative value to

physician decision making. The negative effect of business variable towards decision making process can be explained in that business variable is a formed variable functioned as black box consisting of marketing mix and influence from pharmaceutical industry. Intensive interaction relationship between pharmaceutical companies and physician will establish win-win relationship.

Saenz (2004) mentioned that direct promotion such as detailing as provided by medical representative gives influences to physicians in writing drugs prescription. The negative effects of business to decision making because of the relationship causes physician to make fair and professional decision as he or she has to consider commitment made to pharmaceutical companies. In this situation, the diagnose result become irrelevant in the physician decision making process.

The negative coefficient of relationship between internal factors and drugs decision making because when the physician motivation is not influenced by other factors, it will go positive relationship. In this respect physician has applied good professional practice of which the research reveals that personal physician motivation will affect strongly other factors. The negative relationship factors of knowledge and physician motivation because other factor such as business factors, gives more influence so as physician motivation leads to negative effect on drugs prescription decision too. Simultaneous this situation balanced by regulation and patient economical condition with positive impact to physician decision making.

Therefore, the final decision made by physician, in fact, has still considered factors of drugs types (generic, branded generic, and patent), medication guideline and patient buying power. The three factors runs simultanously and interrelated on which it is backed up with similar their loading factor values. As explained above, in terms of quality among generic, branded generic and patent are not really different as the differentiation is on the price. In normal condition, patient must be given with the cheapest drugs in case there are not any choices. It might be happen that although the patient is poor, physician might give the expensive drugs because guideline has not covered it. On the other hand, physician might give the cheapest drugs regardless the fact that the patient is rich. In this reaserch has shown that treatment guideline and purchasing power



of patient still keep in doctor mind as considarition in prescribing drugs as well.

6. Managerial Implication

As explained above, the drugs prescription decision is a complex decision by which this situation will lead to wide managerial implication. Physician has central roles whereas patient merely follow what decided by physician. There is a conflict of interest in relation between doctors and pharmaceutical companies. The government should give attention to the enforcement of existing regulations to provide punishment for noncompliance and reward those who follow the rules. Followed by an increase in welfare for doctors, currently most doctors are civil servants wages system is the same as any other position.

From the physician side, enforce regulatory compliance issues that exist as the main target and role of association should involved in improving process as well. Only doctors themselves are capable of enforcing ethics of the profession and not the other institutions or body.

Pharmaceutical industry also have to enforce regulatory compliance as the main target too. Improve the business way more marketing driven instead of sales driven, means more scientific approach rather then comercial approach as well.

7. Conclusion and Remarks

Physician decision is a complex decision involving many interacting factors. Diagnosis, business factors, internal factors having an effect negatively on the decision to prescribe the drug. This means that doctors tend to prescribe branded generic drugs or patent instead of generic drugs. Economic conditions and regulatory positive influence on the decision to prescribe the drug. These factors act as a counterweight to the doctor's decision.

All categories of drugs have the same opportunities to be prescribed in patients, indicating that treatment guidelines, professional attitude and commercial interests, and the purchasing power of patients have equal role in decision-making of doctors.

To sharpen the results of the study, further research needs to include information related to the historical data of drug categories (proportion) in the doctor prescribes a certain period. Need to distinguish between medical specialists and general practitioners, to see the behavior in prescribing drugs.

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