

A Study on FTA BM Modeller for SMEs

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Abstract

This study shows a methodology by which even SMEs can enjoy the benefits of FTA preferential treatment through IT technology. IT-based technology is necessary for the personnel of SMEs to be able to get the benefits of FTA preferential treatment, especially because it enables the personnel of SMEs as “non- professionals” to modeling the decision and confirmation of tariff classification for determination of rules of origin by themselves. This article previews the IT technology factors and logics by which one can simulate the BM models, that is to say, “FTA BM modeller” for utilizing FTAs. To achieve this, this article constructs the analyzed BM best practices which have utilized FTAs as practices base, reuses and stores the best practices in the engine by best practices base logics, and presents the logics by which system capacity can be continuously upgraded.

Keywords: Business Model (BM), CBR, FTA, SCM, SME

1. Introduction

Expansion for regional economic blocks such as FTA, etc. contributes to the increase of economic welfare of every country by activating the import and export trade all over the world. Large-scale companies, however, occupy the main portion in utilizing the FTA preferential treatment.

In perspective of international logistics, BMs involved utilization of FTAs is as follows: The countries which supply raw materials:

- Can minimize the cost by diversifying the importing sources through global sourcing in or out of FTA region or in domestic area.
- Can reduce the logistics cost by locating logistics warehouses in Free Trade Port (for example, Singapore).
- Can maximize trade profit by utilizing the production facilities which are stationed in FTA partner countries and exporting goods to other FTA partner countries.
- Can act as an FTA HUB and as one of the largest beneficiary countries by attracting overseas foreign investment and utilizing domestic production points in case that every FTA benefits are all available, and further.

- Can utilize every FTA preferential clauses such as outward processing (GaeSeoung industrial complex, or other prescribed areas in agreed countries), intermediate goods, set goods, “de minimis” process, accumulation production, etc.

But it has to be emphasized that almost BMs which are presented by WTO, WCO and Customs authorities of every country for utilizing FTA and origin preferential treatment are very restrictive in dealing with SMEs. This comes from the fact that SMEs have difficulty in getting the benefits of FTAs because of lack of human resources who can give consulting services to them and lack of in-company personnel who can perform FTA-related tasks. In this regard, this study aims at fulfilling such needs as follows: Firstly, information technologies for servicing will have to be more utilized by SMEs. Secondly, successful best practices of FTAs will have to be systematically managed to be able to be reutilized by SMEs by classifying typical forms. Thirdly, the assistance of decision-making will be in need for SMEs to create new BMs by making every module by BM categories. In this perspective, this study presents the method by which SMEs can reutilize business best practices for utilizing the FTA preferential treatment at the largest level.

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2. Way Forward for Developing FTA BM

The most important parts can be pointed as “information”, “function” and “area” in manifesting the FTA BM simulator, that is, the FTA BM modeller, for utilizing FTAs at maximum level. Firstly, information to be provided includes FTA-related information, BM model information, commodity-related information, and so forth. Secondly, the necessary function includes management function of basic data and information and system function by which know-hows for success can be systematically provided. Thirdly, FTA BM will have to consider the entire stages of supply chains including supply, storage, production, distribution, etc. in collective basis.

2.1 Necessary DBs for FTA BM Modeller

Necessary DBs for FTA BM modeller include basic information DB, function logic DB, applied area DB. Firstly, basic information DB means DBs related commodities, HS, FTA agreement, preferential tariff, rules of origin, and so forth. Secondly, function logic DB includes BM factor, model algorithm, international logistics SCM utilization logic, best practice analysis logic, and so forth. Thirdly, applied area DB means indexes which will be applied to, and, utilized by BMs, and includes indexes for HS, commodities, FTA agreement, preferentiality, decision of origin, BM, function, etc.

2.2 Functions which the FTA BM Modeller Provides

Functions which the FTA BM modeller provides will have to utilize at maximum level the FTA BMs which has been already developed and will have to be verified in perspective of validity of newly developed models according to environment of each company's own. Firstly, in case of best practices base, model factor, algorithm, utilizing model, the outcome of developmental model, etc. will have to be managed. Secondly, knowledge service function by which SMEs develop BMs by themselves will have to be provided. Thirdly, the functions of indexes include function of describing purposes (“descriptive”), function of being utilized in new areas (“abstract”), function of being easily understood (“concrete”), and function of predicting the outcomes of utilization (“predictive”), and so forth.

2.3 Areas which the FTA BM Modeller Supports

Types of FTA BM by SCM stages of import and export trade can be classified as supply logistics BM, production logistics BM, storage logistics BM, distribution logistics BM, etc.

Firstly, supply logistics BM includes global-sourcing BM, direct consignment BM; intermediate-goods supply BM, etc. Secondly, production logistics BM includes outward processing BM, FTA HUB BM, production point BM, export point BM, accumulation production BM, set goods BM, “de minimis” process BM, etc. Thirdly, storage logistics BM means overseas logistics point BM and includes the case of allowing utilization of logistics warehouse of a country in FTA region. Fourthly, distribution logistics BM means BM for securing markets, that is, profit-maximizing by considering the market shares of FTA partner countries and out-of-the-region countries.

To explain supply logistics BM in some more detail:

- Global sourcing BM means a model in which change of sourcing from non-FTA countries to FTA countries takes place and cheap raw materials are imported from FTA countries to minimize the cost of raw materials.
- Direct consignment BM means a model in which exploited ores or fisheries are directly internationally consigned.
- Intermediate goods supply model means a model in which a manufacturer produces intermediate goods by utilizing non-originating raw materials (raw materials from countries other than one country and other countries which are not related with FTA).

Production logistics BM is explained in detail as follows:

- Outward processing BM means a model in which goods produced in one country by utilizing re-imported goods in condition of exemption for tall processing are exported to FTA partner countries.
- FTA HUB BM means a model in which goods completed by utilizing raw materials imported in duty-free condition from FTA partner countries are exported to another FTA countries on condition of fulfilling rules of origin.
- Production point BM means a model in which production facilities are located in the domestic area for attracting overseas foreign investment. Regarding this model, main target countries include Japan and China which have not yet concluded FTA agreement with USA.

- Export position BM means a model in which production facilities are located in foreign countries and duty-free trading is possible by utilizing FTA bonded processing area.
- Accumulation production BM means a model in which all the intermediate goods are utilized in one FTA country.
- Set goods BM means a model in which goods of outward countries and goods of inward countries are allowed as constituting set goods and the set goods of which the non-originating portion is less than prescribed rate are recognized as an originating good.
- “de minimis” process BM means a model in which “10% less” value added in outward countries is allowed for being recognized as originating, that is, small percentage of non-originating raw materials is admitted as satisfying tariff-change criteria and recognized as originating.

3. Functions of FTA BM Modeller

3.1 Process of FTA BM Modeller

Operating processes of FTA business modeller may consist of retrieval of practices (“Retrieve”), reuse of practice (“Reuse”), and review of new models (“Review”), retainment of best practices (“Retain”). The first stage means to retrieve the most similar practices among the models of FTA successful practices base (“Retrieve”). The second stage is to develop new BMs by reasoning from the models reused with similar FTA BMs (“Reuse”). The third stage is to review and approve the FTA BMs proposed by modeller logics (“Review”). The fourth stage means to systematically retain the newly-successful FTA BMs in a repository (“Retain”).

Information technologies applicable in FTA business modeller include Case Base Reasoning (CBR), Linear Discriminant Analysis, and database, information searching technique, rule-base expert system, machine automatic learning technique, neural network information technology, and so forth.

Firstly, Case Base Reasoning (CBR) has characteristics that, the more the time of using and running of system, the more stabilizing the reasoning ability and the higher the hitting ratio, even if theories about the applied area are small, and is frequently used in broad areas which users can hardly understand. Forecasted practices make us learn. In case that it is the area where practices cannot

be acquired or complex problem-solving factors have to be accepted or indisputable optimum solution is to be found, the CBR is not practically applicable.

Secondly, Linear Discriminant Analysis of statistical data is an analysis of forecasting the object's where to be assigned between or among 2 or more groups and the forecasting is implemented by categorical variables which are effective in determining the practices known to the attributed group. In case that there exists only experimented analysis data by dependent variables, this analysis is not practically applicable.

Thirdly, a database is a group of data which are arranged in a pre-determined structure. In case that well-structured and standardized data is prepared and simple forecasting questionnaire is possible, it is practically applicable. Solutions can be found from the searched practices and such solutions can also be reusable. Broad appropriate range can be rapidly provided and by that range one can get the correct solutions. In case that data are not complex and are less structured and the questionnaire is complex, it is not practically applicable.

Fourthly, information searching technique is appropriate to utilize when large-scale text data is constructed. Information searching technique is not appropriate to utilized when data falls on a non-text type and is complex and basic background knowledge is not sufficient.

Fifthly, the rule-base expert system is appropriate to use in certain specialized areas where theories are much accumulated, and is stably used for a long period because experts who well understand the areas in question are many. This system uses matters (cases) and “if-then rules”, and learning is not possible and new rules have to be added manually, even if solutions are provided, and used rules can be traced and explained. In case that the questioned area is not well-understandable and continuously changing, rule-base expert system is not practically applicable.

Sixthly, machine automatic learning technique is to analyze past practices to induce the rules which will be applied to a case set and these rules are applied to solve new problems. Induction Algorithms which are used in CBR is originated from this machine automatic learning technique area. In case that rules cannot be secured or determinations which traced the rules are not accepted, this technique is not practically applicable.

Seventhly, synthesis tasks are to create new solutions

by combining the parts of previous solutions. In this synthesis tasks, adaptation is used and, sometimes, the hybrid system in which other technologies and CBR are combined may be used. In these tasks, it is assumed that it is faster to improve the previous good designs or plans than to create new things. Synthesis tasks are more difficult than classification tasks because right feature has to be placed in right position in right order.

Case Based Reasoning is a concept similar to induction and analogy. Inductive reasoning is a methodology in which conclusion is induced on the basis of pre-given premises. Conclusion induced by inductive reasoning apparently looks true but may not be true. Analogy Based Reasoning is related to reasoning the case where C is related on the analogy of the relation of A and B. Case Based Reasoning is a process in which new problem is solved on the basis of the solutions of similar past problems.

3.2 Points to Note when FTA Business Modeller Logics are Designed

Points to note when the logics of Case Based Reasoning for FTA business model simulator are designed can be enumerated as follows.

Firstly, indexes. How can the practices of the most similar to the present pending problems be searched and extracted among numerous practices? The reason that indexes are one of the points to note is that searching and extraction is not efficient and, sometimes, even impossible, without indexes.

Secondly, adaptation. In order for us to be able to use the practices extracted for the purpose to solve present situation, the contents of the extracted practices will have to be changed, and the adaptation means the change of such practices for us to be able to use in a new situation. The importance of adaptation comes from the fact that the extracted practices have to be re-inputted to new problems to solve problems and CBR process is not concluded by mere extraction of similar practices, from practices library.

3.3 Guidelines of FTA Business Modeller Logics

Guidelines of heuristic logics, as the basis of FTA business model simulator, are as follows. Guidelines of heuristic logics are those which are used by experts to verify main usability issues in heuristic evaluation. Those guidelines are, in principle, appropriately determined according to

characteristics of evaluation objects, but, common general principles exist. Among this, here 10 guidelines of Jacob Nilsson are presented as one of representative heuristic logic guidelines which are used in WEB.

Firstly, visibility of system status. System has to be provided, in appropriate time, in the appropriate type easy to perceive information, about system condition to users.

Secondly, match the system and the real world. System has to be used without any confusion by users, by reflecting in system design appropriate methods and terminologies which are pre-researched and are met in real world.

Thirdly, user control and freedom. System has to provide to users some degree of freedom by which certain functions erroneously selected are restored or returned to the smooth condition.

Fourthly, consistency and standards. Generally-used criteria have to be conformed to and consistency in and out of system has to be maintained.

Fifthly, error prevention. When there occur errors, appropriate information about these errors has to be provided, and furthermore, it is the best to prevent the occurrence of errors from the first beginning.

Sixthly, recognition rather than recall. System has to enable users to appropriately perceive by visualize the object of system and interactions of such.

Seventhly, flexibility and efficiency of use. Promotion factors have to be considered for repeated tasks to be implemented smoothly and for characteristics of users to be appropriately fitted.

Eighthly, aesthetic and minimalist design. Visibility of the system has to be raised up to a high level and esthetically valuable design has to be realized by eliminating unnecessary factors.

3.4 FTA Business Modeller Logic Module

As to constituent modules of FTA business modeller logic, logics to support decision-making is necessary, by comparing searching condition points and contents of existing practice database and by screening the practices of high similarity.

In the first loop, selection of optimum BM practices is made. Similarity between thresholds and presently-searched BM practices are compared and fulfillment of search condition of optimum BM practices is checked by searching optimum similarity BM practices. In the second loop as the lower stage of the first loop, searching

condition of BM practices are selected. In the third loop as the lower stage of the second loop, maximum similarities are calculated by comparing searching condition. In the fourth loop as the lower stage of the third loop, optimum BM practices are selected. The second, the third, and the fourth loop have to be repeated until maximum similarity BM is found.

Constituent factors of FTA business modeler logics largely consist of practices compiler, simulation engine, and practices searcher. Processes of FTA business modeller is progressed in sequence of inputting, knocking-down of practices factors, storing in practice base, searching and extracting, reusing of similar practices, correction, proposing of solutions, confirming and analyzing of solutions, storing.

To explain each constituent factor of the processes of FTA business modeller logics, it is as follows: Firstly, practices compiler supports maintaining of practices by compiling the contents of inputted successful practices and applied algorithm and related information and know-hows and by checking the practices. Secondly, simulation engine supports retrieval, reuse, review, and retainment of practices base. Thirdly, practices searcher presents the solution which the simulation engine provides by searching the success practices easily and rapidly when a user raises a question.

Conditions for the FTA business modeller to be able to act as continuously-efficient and highly-usable system are summarized as follows: Firstly, existed practices and know-hows have to be stored in practices base by standardizing with logics of practices analyzer. Secondly, simulator engine has to be able to support compilation-utilization of factor points for upgrading searching function and reusing existing practices, and to store the outcomes of reusing. Thirdly, continuous and automatic maintaining function has to be equipped with for achieving high hitting ratio.

3.5 DB Structure of FTA Business Modeller

Basic DB structure of FTA business modeller consists of BM type information, information related to countries, commodity type information, company type information, origin determination information.

Firstly, BM type information can be classified as model number, and, name of BM, as BM type, and, supply logistics, production logistics, storage logistics,

distribution logistics, multi-modal logistics, as logistics type, and, processing type, production type, sale type, investment type, as logistics characteristics.

Secondly, information related to countries can be classified as country where goods are produced, country from where raw materials are supplied, country to where goods are exported, distinction according to “FTA agreed or not” criterion.

Thirdly, commodity type information can be classified as exporting commodity name, exporting commodity type:

- i. Raw materials.
- ii. Intermediate goods.
- iii. Complete goods, HS of exporting commodities, business type of exporting commodities:
 - Agricultural · livestock · fishery · forestry.
 - Chemical.
 - Fiber.
 - Clothes.
 - Machinery.
 - Electric and electronic.
 - Vehicles.
 - Food stuffs and beverages.
 - Daily-life miscellaneous goods.

Fourthly, company type information can be classified as company name, scale of company (1. small, 2. medium, 3. large), import and export type (1. export, 2. import, 3. export + import), business type (1. manufacture, 2. sale, 3. manufacture + sale), business place (1. domestic, 2. overseas, 3. domestic + overseas), stages of involving export (1. exporter, 2. 1st assistant company, 3. 2nd assistant company, 4. 3rd assistant company).

Fifthly, origin information can be classified as HS, country, FTA, rules of origin, etc.

Sixthly, practices characteristics information can be classified as practice name, company profile, present situation, problems, summary of practice, effect of outcomes, characteristics, suggestive points, etc.

3.6 Points to Note in Realizing FTA Business Modeller as a Business

To realize the FTA BM simulator as a business, the following points to note will have to be considered.

Firstly, value suggestion. To suggest the value, accuracy of BMs has to be secured, and FTA international logistics BMs have to be developed. Secondly, needs of SMEs, customs brokers, and special express companies as

customer groups have to be responded, and BM success practices related to the goods in which above-mentioned groups are highly interested have to be constructed. Thirdly, tariff classification logics and tariff classification examples and BM determination simulator, as focused resources, have to be constructed. Fourthly, as to service environment, WEB service has to be available for BM determination support. Fifthly, as to cost-profit aspect, cost for developing technologies and cost of technology-transferring and selling have to be considered.

4. Conclusion

The role of many supporting systems of Customs authorities, trade related governmental authorities and public agencies for FTA utilization are not found vividly effective to SMEs. It is necessary to develop and provide FTA BMs which are fit for supporting exportation of SMEs. It seems that SMEs have strong will to utilize the SME-tailored FTA BMs when they are developed and provided. In this regard, FTA BM simulator seems necessary for SMEs. All information related to FTA agreement and FTA BMs will be loaded on it, and, successful practices will be provided and the SMEs will be able to develop FTA BMs by themselves, through it. FTA BM simulator will analyze the practices and reflect the characteristics of diverse FTA-agreed countries and diverse preferential criteria by FTAs and by segments by stages of processing, and will enable the SMEs to simulate BMs for optimizing FTA preferentialities by them.

This study approaches the issue of enlargement of FTA preferential treatment of SMEs, especially through IT technology aspect, considering present situation that main beneficiaries of FTA preferential treatment are limited only to large-scale companies even if number of FTAs increases.

In order for SMEs to obtain the benefits of FTA preferential treatment, determination of tariff classification and confirmation thereof will have to be autonomously implemented by even “non-professional” personnel’s of SMEs, and, in turn, for achieving this, IT-based technology by which personnel’s of SMEs can create by themselves BM models for comprehensively utilizing FTAs will be additionally required.

For this, this study constructs practices base by analyzing previous BM practices, and develops the logics by which practices are reused and stored and system capacity is continuously upgraded, and finally reviews the IT-based methodology by which even “non-professional”

personnel’s of SMEs can easily have access.

It is highly hoped that this article will be used as a basic reference material in system development in detailed level and utilization of such system by linking with “Tariff Classification Searching System” and “Origin Determination Supporting System”, etc.

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