

Scheme of 'New Product and Service' System Creation Using TRIZ - Search for a Creating Method of "New Product and Service" System by Analyzing "Hot Sellers and Services" Using TRIZ -

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Change Risk to Chance with TRIZ!

What are the business and management TRIZ research subcommittee meeting?

- It acts for the spread and the development of the research on the business and the management field and TRIZ like the construction of the guidance etc.
- Fiscal year 2012, the TRIZ idea and the technique are applied, "Hot-selling product and service" system is analyzed, and it has searched for the method of creating "New item and service" system.
- Fiscal year 2013, the frame of "New item and service" system creation that applies TRIZ is presented from a current result of review.

[Contents]

- 1.Is there a law in the creation of "New item and service" system?

 [two hypotheses and hows (details) to advance research activities]
- 2.Creation of "New item and service" system (frame of approach)
- 3.Method of approaching "New item and service" system creation with present axis
- 4."New item and service" Comparison between system and contradiction settlement plan verification of hypothesis 1
- 5.Relation between life cycle and evolution trend of system verification of hypothesis ②]
- 6.Method of approaching "New item and service" system creation with axis in the future
- 7.Approach for fiscal year 2014 to deepen content of frame of "New item and service" system creation



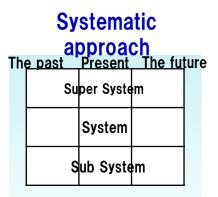
1. Is there a law in the creation of "New item and service" system? Two hypotheses and how to advance research activities

 A concrete case with "Hot-selling product and service" system is researched.

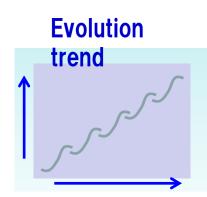


It analyzes it by the TRIZ idea and the technique.









It searches for the method of creating "New item and service" system.

Frame of 'New item and service' system creation Required hypothesis 1

- The contradiction situation caused by a past "Commodity and service" system and no adjustment of the user needs is analyzed by the functional assay.
- A common function and characteristic to settlement plan and "New item and service" system of the contradiction solution are analyzed.
- When it is effective for the creation of the center idea of contents with which the settlement plan of contradiction creates "New item and service" system if a common function and the characteristic can be found, it catches.

Frame of 'New item and service' system creation Required hypothesis 2

- It is thought that it is not necessarily guaranteed whether the market accepts all created "Commodity and service" systems if needs and seeds are suited.
- Then, the method of medication of a general evolution trend (evolution trend of 32 of the Darrell Mann advocacy) for the business presented as 'Pattern' in which the market accepts the system is designed.
- Whether "Commodity and service" system along at the evolution level of the evolution trend passes by the method of medication of the designed evolution trend and it is being offered to the market in the age are analyzed, and the event is found.
- If the event can be found, it is caught that do ..application of the evolution trend and the evolution level.. direction of "New item and service" system creation ..adequate.. in the contents creation when it is effective.

How to advance research activities (details)

- 1. The business (business) that keeps putting out "New item and service" system and grows up is specified.
- 2. The characteristic in which "New item and service" system is created is analyzed.
 - The change factor of the market as assumption that creates "New item and service" system is specified in the passing age. The frame that grips the change factor in the future is made.
- 3.It is examined whether the contradiction discovery and the solution are effective for the creation of "New item and service" system.

The contradiction (dilemma demand) that the user holds in dealing with the change factor is specified, and it is verified whether there is commonness in the function and the characteristic of "New item and service" system from which the function and the characteristic of the settlement plan are offered to the market. There is an effective possibility if there is commonness.

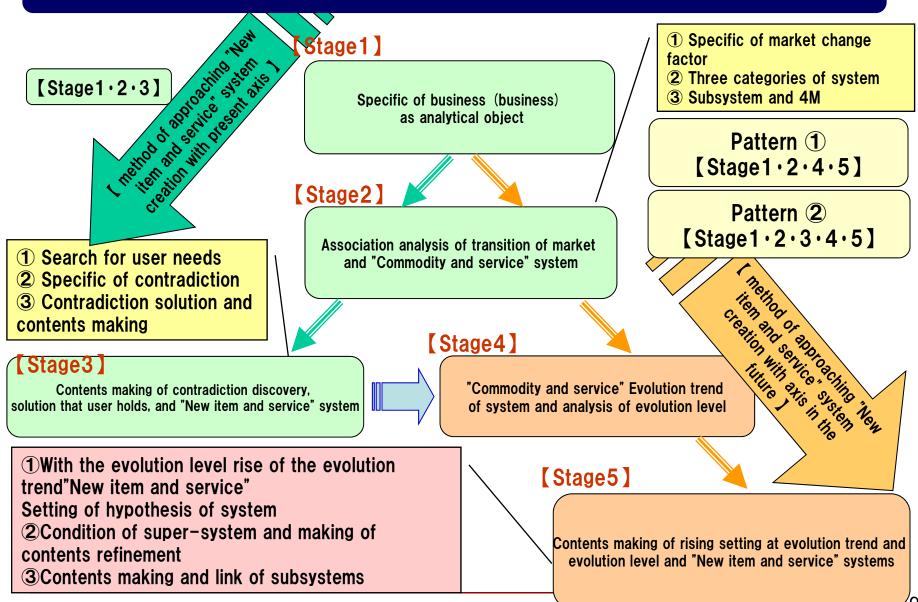
- 4.It is examined whether the application of the evolution trend is effective for the creation of "New item and service" system.
 - 1)The method of medication of a general evolution trend (Darrell Mann advocacy) is designed.
 - ②The design method is applied, and "Commodity and service" system: at a specific evolution trend and the evolution level.
 - The event of being offered to the market along in the passing age is found. If the event can be found, an evolution trend and an effective possibility of the application of the evolution level can be said.
 - ③Because an evolution trend and an effective possibility of the application of the evolution level can be said, it applies to an existing "Commodity and service" system. It pays attention to any of some the evolution trends (Darrell Mann advocacy) that are, and at which evolution level the target was squeezed is analyzed.
 - (4) The evolution level of the specified evolution trend is raised, and the hypothesis of "New item and service" system (scenario) is made.
- 5. The creation process of "New item and service" system by the application of the contradiction discovery, the solution method, and the evolution trend is designed from these, and the frame is presented.

2. Creation of "New item and service" system [frame of approach]

Frame of 'New item and service' system creation Definition of "Commodity and service" system

- Business (business)
 - Cooperation of labor activity done for a certain achievement of constancy and purpose (new publication business and central economy company of business administration dictionary)
 - "Commodity and service" System
 - System where technological system and man activity system have emergence [suru] function and characteristic in medium that achieves function that user demands
 - "New item and service" System
 - "Commodity and service" system that has new effect accepted to market

Frame of "New item and service" system creation approach



Japan TRIZ Society Business and Management WG

3. "New item and service" system in present axis Method of approaching creation

[Stage 1] Specific of business (business) as analytical object [Stage2] Association analysis of transition of market and "Commodity and service" system (1) Specific of market change factor 2 Three categories of system 3 Subsystem and 4M [Stage3] With contradiction (dilemma demand) discovery and the solution that the user holds Contents making of "New item and service" system (1) Search for user needs 2 Specific of contradiction 3 Contradiction solution and contents making

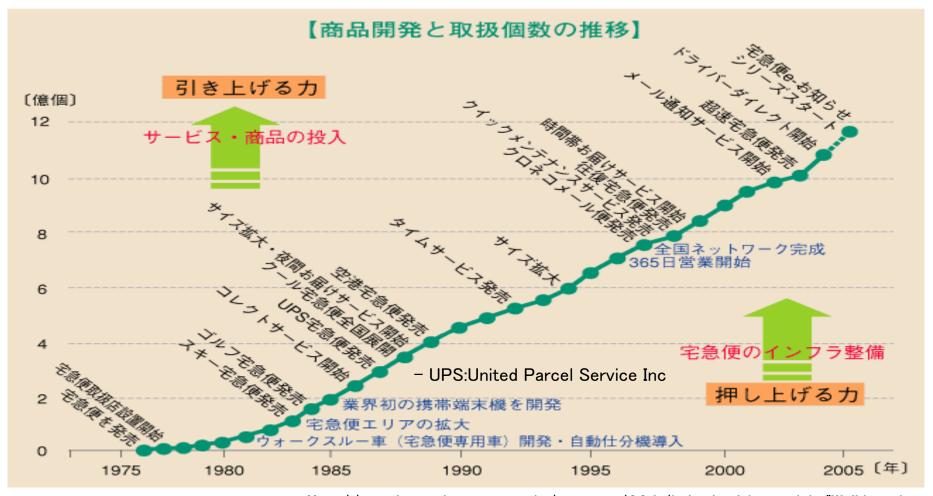
Creation of "New item and service" system [Stage1] Specific of business (business) as analytical object

- [definition of growth continuation business (business)] It keeps continuously putting out [wo] and "New item and service" system, and it is assumed the business (business) that has grown up for ten years or more.
- Then, it takes up as a growth continuation business that should consider "Business of delivering to home" that keeps putting out "New item and service" system for the past 40 years, and it will analyze it.

Creation of "New item and service" system [Stage 1]

Specific (analysis) of < growth continuation business > case

"Business of delivering to home" and "Commodity and service" system



"Commodity and service" list of business of delivering to home

From Yamato Transport homepage: http://www.kuronekoyamato.co.jp/corporate/index.html



☆宅配便発売

☆コレクトサービス

☆タイムサービス

☆往復宅急便 ☆クイックメンテナンス

☆e-お知らせ

シリース

☆宅配便取扱店設置

☆夜間お届けサービス ☆サイズ拡大 サービス

☆超速宅急便

☆メール通知

☆スキー宅急便 ☆クール宅急便

☆UPS宅急便

☆クロネコメール便 ☆時間帯お届け

☆ト′ライハ′ー

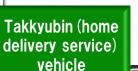
☆ゴルフ宅急便

☆空港宅急便

☆365日営業開始

ダイレクト

Information system



















Low pollution and gas-snipper

Big teapot 1976年 3.4%





1997.11 Ogasawara Islands Takkyubin (home delivery service) handling beginning. Nationwide network completion

Foreign country

The 1970's

The 1980's

The 1990's

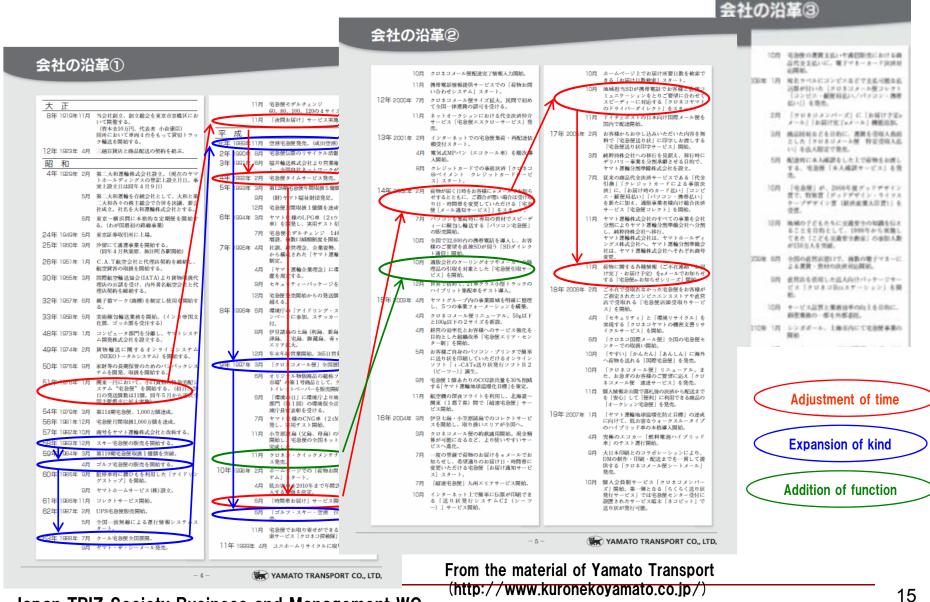
The 2000's

Creation of "New item and service" system [Stage2] Association analysis of transition of market and "Commodity and service" system

1 Specific of market change factor

- The systematic approach (multi-dimensional, creative idea) with two axes of "Super-system system subsystem" and "Time" is applied, and the change factor of the market where "New item and service" was created is specified.
- "Commodity and service" system turned on to the market is arranged along the time axis. Some the aspects of "Commodity and service" arranged with the time axis are set. Here, 5W2H is applied.
- A super-hierarchy of system should set a hierarchical number according to the object system. Here, three hierarchies are set. "User (customer), consumption (person) trend, and general social climate" is set as a super-system, and the change factor is analyzed.

"New item and service" system seen with the time axis



Creation of "New item and service" system [Stage2]

Specific of change factor of < market and "Commodity and service" System (analysis) > case

"Commodity and service" characteristic of system and application of systematic approach

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6	一般的な 社会環境			高級品、輸入品ブーム	共働き	インターネット、携帯電話 普及	
Super-system	消費(者)動向			生鮮食品ギフト、産地 直送の野菜 や魚介類		ネットショッピ ング、ネット オークション	ネットショッピ ング、ネット オークション
m	利用者(顧客)	自宅まで届け てほしい (これまでは 最寄駅留)	指定日に届 けてほしい	朝一番に届けてほしい	受取人が在 宅の時に届け てほしい	受取人に配達 時間帯を知らせてほしい	受取人の都合の良い時間帯に届けてほしい
	年代	1976年	1988年	1992年	1998年	2002年	2005年
System	いつ届けるかという視点	不定時配送	指定日 配送	タイム サービス	時間帯 お届け サービス	メール通 知サービ ス	不在通知 e-メール サービス

Creation of "New item and service" system [Stage2] Association analysis of transition of market and "Commodity and service" system

2 Three categories of system

- To clarify the development process of "Commodity and service" system based on 'User and consumption (person) trends and general social climates' by three hierarchies of a super-system, it thinks about the system as follows.
- The frame that grips the change factor in the future is made.
- Commodity and service concerning "Additional value to society"

System that contributes to society general of social responsibility etc. (CSR) of natural environmental protection and enterprise.

- ·It specifies it by the relation to "General social climate" of a super-system.
- Commodity and service concerning "Additional value to user (customer)"

System that tries to fill needs concerning compliances of safety, safety, and guarantee, etc. (societal demand) that user (customer) hid by him/herself.

- ·It specifies it by the relation to "Consumption (person) trend" of a super-system.
- Commodity and ..".. service concerning basic function of business (purpose)

System that tries to have been declared user (customer) or to fill true needs with the one personally related to basic function of business (business) (purpose).

·It specifies it by the relation between "User (customer)" of a super-system and the stake holder.

Creation of "New item and service" system [Stage2] Association analysis of transition of market and "Commodity and service" system

3 Subsystem and 4M

- The subsystem is analyzed by the aspect of 4M (Material,Method,Machine,Man). What kind of element is set respectively depends on the object system.
- In the following cases, Material (machine parts and timber for wooden box, etc.), Method (environment, method, technology, and information, etc. related to the organization and the business accomplishment), Machine (vehicle, fixture and furniture, and information device, etc.), and Man (talent, skill, and knowhow, etc.) were set.

Creation of "New item and service" system [Stage2]

Specific of < market transformation and "Commodity and service" System (analysis) > case

Super-system system subsystem

[Super-system Three categories]

- 1) General social climate
- 2 Consumption (person) trend
- **3**User (customer)

[System Three categories]

- **1**To "Additional value to the society" Concerned commodity and service
- **2**Commodity and service regarding to "Additional value to user (customer)"
- **3**Commodity and service regarding to "Basic function of business (purpose)"

[the subsystem And 4M category]

- 1 Material 2 Method
- 3 Machine 4 Man

		1985年	1986年	1987年	1988年
System	一般的な社会環境	プラザ合意 NTT, JT発足 日航ジャンボ機 墜落	カウチポテト族 団塊の世代40 代突入	JR発足 総合保養地域 整備法制定	青函トンネル 開通
System	消費(者)動向		通販の普及	「本の宅配」 ヒット商品	高級生鮮食材
kρt	利用者(顧客)		個人消費の拡 大		
	社会への付加価値 サービス	9月 : アイドリング ストップ			
System	利用者(顧客)への付加価値サービス		10月:時間便 11月:コレクト サービス		11月:夜間お 届けサービス 開始
Ĭ	小包を配送する サービス	7月:引越しらくら くパック	10月:ブックサー ビス	2月:UPS宅急 便	7月:クール宅 急便全国展開
	Material (機材 • 梱包材な ど)	家財道具梱包箱	本専用梱包袋		生鮮食品等取り扱い箱(クーラーボックス) 11月:サイズモデルチェンジ
Subsystem	Method (組織編成、業務 遂行に関わる環 境・方法・技術・情 報など)				
stem	Machine (使用機材、デバイ スなど)	業界初専用携帯 端末開発		全国一波無線 5月:運行情報 システムスタート	冷凍、冷蔵 付、配送車
	Man (人材、スキル、ノ ウハウなど)	SD(セールスドライバー)、ターミナル操作、アイドリングストップを行う	金銭取り扱い		

Creation of "New item and service" system [Stage3] Contents making of contradiction (dilemma demand) discovery, solution that user holds, and "New item and service" system

- **1**With an existing "Commodity and service" system No adjustment of the user needs is found.
 - - The function of a present "Commodity and service" system (purpose) is defined. This is assumed to be a profitable function of "Commodity and service" system.
 - "System of the activity related to" found from the definition to put the viewpoint on the user is assumed to be a profitable function. These functions are arranged by the logic of "Purpose – the means", and the profitable function system chart is made.
 - Making of "Functional diagram"
 - "Functional diagram" is made by finding the adverse effect that the method of achieving a profitable function of "Commodity and service" system is caused as a cause and the adverse effect that obstructs a profitable function as the user needs, and relating it to the profitable function system chart.

Model of 'Global procurement support system [Yamato HD]' (case)

It is analyzed whether contradiction (dilemma demand) discovery and the solution that the user held were offered to the market as "New item and service" system.

Situation before 'Global procurement support system [Yamato HD]' is offered to market as "New item and service" system

Situation of market

Major manufacturing has accelerated the move of the manufacturing base to foreign countries for the low labor cost. Under such a situation, a lot of parts suppliers have a hard time in the communication with the subcontract enterprise that remains in Japan because it moved the manufacturing base with major manufacturing. It mails and it often does by fax, and it takes people and time to the order and the delivery date management of parts of the manufacturer and the subcontract enterprise.

Creation of "New item and service" system [Stage3]

Definition that stands in < user's viewpoint and "System of activity related to" (analysis) > case

Is the situation in which a present "Commodity and service" system is surrounded caught as what kind of related activity system?

- *The stake holder (organization and people) is specified.
- *How to catch <It is possible to mean it > of the related activity system
- ❖ If you see for the organization and people who have relations "It want to be so" Isn't it "It is – as for –. "?It asks oneself, and it catches as "System that does ––". Or, it catches as "−– is done" and "System that can do ––"

For the user (foreign parts manufacturer)

- ·System that procures parts of proper dose
- ·System that at the right time procures parts
- ·System that secures proper stocks of parts
- ·System that efficiently does ordering
- ·System that efficiently does delivery date management
- $\cdot \text{To the major manufacturing enterprise}$ and parts of the proper dose to timely

System that supplies it

It is possible to be able to mean it by these.

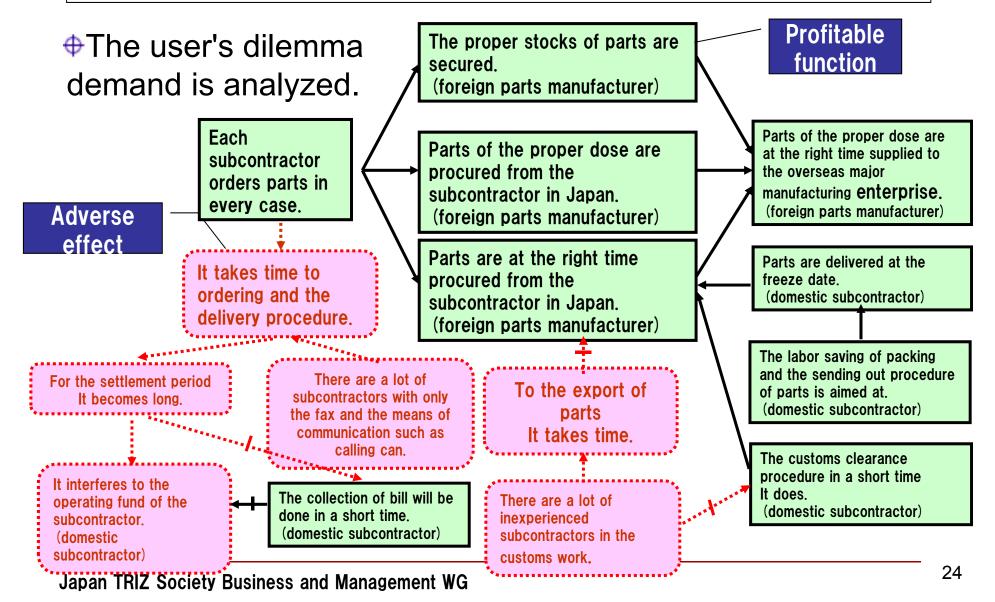
For the user (domestic subcontractor)

- · System that efficiently does ordering
- System that attempts labor saving of sending out procedure
- ·System that attempts labor saving of part packing
- ·System that delivers parts at freeze date
- System that does customs clearance procedure in a short time
- ·System that does collection of bill in a short time

It is possible to be able to mean it by these.

Specific pattern for functional diagram and contradiction Specific pattern for Functional diagram contradiction **Profitable** Adverse effect Profitable function The other function **Profitable** (target function Pattern D Pattern D' function) It obstructs it. It obstructs it. Profitable Profitable function Profitable function Pattern A function (target function) (means function) It contributes. (means function, Pattern B Pattern C It causes it. It excludes it. **Profitable** Adverse function to have caused effect contradiction Adverse effect Adverse effect Pattern B' (result) (cause) It causes it.

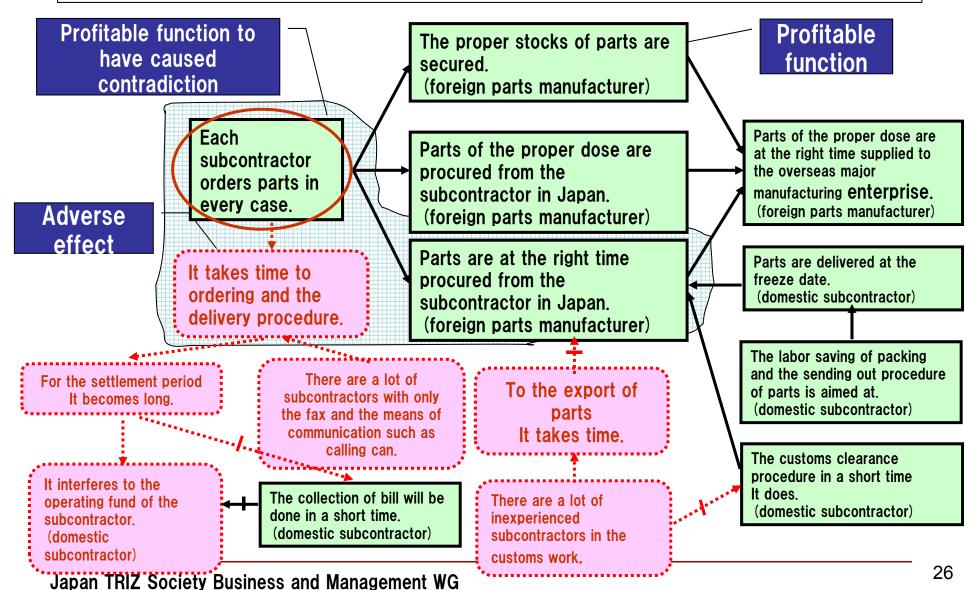
Creation of "New item and service" system [Stage3] [functional diagram] < functional assay > Case



Creation of "New item and service" system [Stage3] Contents making of contradiction (dilemma demand) discovery, solution that user holds, and "New item and service" system

- 2 The center contradiction is specified, and the solution is found.
 - Contradiction is specified from "Functional diagram".
 - It tries to contribute to a profitable function that becomes a purpose from "Functional diagram", and a profitable function to cause the adverse effect or to obstruct other profitable functions is specified.
 - The idea of the contradiction solution is conceived.
 - "Contradiction matrix" and "Invention principle of 40" are applied and the solution is found.
 - ***** [Hands-On Systematic Innovation for Business & Management] 2007 by Darrell Mann

Creation of "New item and service" system [Stage3] [functional diagram] < functional assay > Case



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r =h-	【対立する特性】	R&D 仕様/能力/手段	R&D コスト	R&D 時間	R&D リスク	インターフェー	生産手段 仕様/能力/手	生産手段 コス	生産手段 時間	生産手段 リスク	生産手段	供給 (能力/手段	供給コスト	供給時間	供給 リスク	供給インターフェー	製品信頼性	サポートコスト	サポート時間	サポートリスク	サポート	/フィードバック	情報量
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1	R&D 仕様/能力/手段			35-23	24.23	24.33	35•4	10.3	10.2	10.2	37•1	35-25	1.5	12.26	30•31	2.5	2.35	28•25	6.27	40.12	5•9	22.7	25.
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3	R&D 時間	21·38 35·23	26·34 1·10		1·29 10·40	15·25 35·1	5·6 20·35	5·29 35·2	7·26 10·15	6·15 7·37	25·23 35·29	11·6 23·19	5·13 23·25	10·25 7·2	23·7 29·2	11·7 40·38	6·10 3·35	7·15 40·26	7·40 1·26	23·24 2·37	6·10 26·24	7·19 21·29	7· 37·
4	R&D リスク	3.9	27.9	1.29	10 40	6.29	24.35	5.35	5.40	11.23	7.3	5.35	1.11	1.2	13.7	13.22	6 • 1	11.7	1.2	40.36	6.10	36.13	1.
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5	R&D インターフェース	24.33	35•10	35•1	15.14		17•40	29.5	23.3	3.37	6.29	15.13	3.15	35.10	13.40	6.15	3.35	40.38	20.10	40.13	6.7	25.40	3.
6	生産手段 仕様/能力/手段	23·29 35·4	5·2 27·1	5·6 20·35	24·35 10·3	5·6 17·40		15·25 3·10	1·35 21·15	6·27 35·22	3·25 17·35	7·13 22·6	15·35 13·22	35·5 13·22	15·16 3·2	10·25 3·33	35·23 1·24	13·10 17·2	5·6 10·12	6·10 2·27	6·40 10·2	5·15 35·25	
7	生産手段 コスト	37·35 10·3	26·35	5·29 35·2	5·35 40·23	15·23 29·5	15·25 3·10		1·24 19·10	26·10 1·3	26·1 37·25	5·2 30·35	5·35 31·2	2·35 24·10	2·13 10·26	12·3 35·5	1·35 10·29	3·2 35·10	27·3 10·25	10·25 27·3	10·35 7·24	7·13 1·24	26 25
8	生産手段 時間	35-6	10.2	7.26	5.40	15.40	1.35	1.24	13 10	10.27	10.15	5.17	5.2	3.10	13.2	23.12	1.35	3.13	35•25	35-29	13.9	13.1	13
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9	生産手段 リスク	10.2	23.26	7•37	39.7	3.37	35.22	1.3	15.6		23.20	3.35	23.25	25•1	35.2	40.2	2.15	19.24	13.35	3.10	33.7	7•13	3 -
10	生産手段 インターフェース	5·7 37·1	15·35 10·25	25·23 35·29	7·3 17·23	28·40 6·29	3·25 17·35	26·1 37·25	10·15 38·20	5·6 23·20		6·2 37·40	5·30 10·15	5·35 6·13	23·33 5·26	33·5 2·26	23·11 40·2	23·10 3·13	23·13 10·1	10·14 2·25	40·33 6·10	7·5 10·40	2 .
11	供給 仕様/能力/手段	6·2 35·25	23·6 11·28	11·6 23·19	5·35	6·35 15·13	7·13 22·6	5·2	5·17 16·3	5·25 3·35	6·2		7·35 19·1	35·1 13·2	7·8	6·30 15·40	11·23 35·1	23.11	23.11	11·23 24·2	23·11 2·25	10·3 25·5	13 28
12	供給 コスト	15.6	10.5	5.13	1.11	2.33	15.35	5.35	5.2	5.35	5.30	7.35	19.1	3.24	27.3	1.28	35.24	27.5	10.27	10.12	10.24	2:35	28
		1·5 2·3	35 10:19	23·25 10·25	2·34 1·2	3·15 5·2	13·22 35·5	31·2 2·35	35·13 3·10	23.25	10·15 5·35	19·1 35·1	3.24	38.10	19·24 10·29	6·38 5·19	5·13 25·10	35.25	30·35 27·2	2·27 10·25	25.1	13·25 35·13	_
13	供給時間	12.26	35-22	7.2	11.38	35-10	13.22	24.10	23.40	25•1	6.13	13.2	38•10		15.13	3.15	29.19	10.2	13.35	35.6	35.25	25.1	37
14	供給 リスク	11·39 30·31	11·13 2·16	23·7 29·2	13·7 9·37	5·35 13·40	15·16 3·2	2·13 10·26	13·2 35·10	5·26 35·2	23·33 5·26	7·8 11·10	27·3 19·24	10·29 15·13		5·10 25·37	1·35 6·24	19·10 5·27	2·27 10·5	24·25 10·7	5·35 2·13	25·22 2·35	15
15	供給 インターフェース	11.26	10.38	11.7	13.22	28-40	10.25	12.3	23.12	5.10	33.5	6.30	1.28	5.19	5.10		10.31	5.10	29.30	5.25	5.6	13.25	3
16	 製品信頼性	2·5 36·11	13 27·6	40·38 6·10	25·9 6·1	6·15	3·33 35·23	35·5 1·35	3·24 1·35	40·2 13·35	2·26 23·11	15·40 11·23	6·38 35·24	3·15 25·10	25·37 1·35	10.31	24.35	26·1 2·25	2·25 22·25	10·9 13·22	38·40 28·25	39·24 28·25	_
-	-	2·35 15·35	1·10 6·1	3·35 7·15	26·37	3·35 6·7	1·24 13·10	10·29 3·2	10·38 3·13	2·15 3·35	40·2 23·10	35·1 23·11	5·13 27·5	29·19 25·27	6·24 19·10	24·35 5·10	2.25	10.35	15·3 5·4	10·35 27·35	5·7 26·25	7·22 24·25	3 - 28
17	サポートコスト	28.25	10.25	40.26	28.35	40.38	17.2	35·10	25.5	19.24	3.13	2.6	35.25	10.2	5.27	26.1	10.35		25.10	25.14	37.3	37.3	17
18	サポート時間	5·2 6·27	6·1 25·10	7·40 1·26	1·2 32·28	6·38 20·10	5·6 10·12	27·3 10·25	35·25 5·4	24·14 13·35	23·13 10·1	23·11 26·2	10·27 30·35	27·2 13·35	2·27 10·5	29·30 2·25	22·25 15·3	5·4 25·10		15·29 9·19	15·29 10·1	7·20 24·35	15
19	サポートリスク	15.27	10.25	23.24	40.36	5.35	6.10	10.25	35-29	7.5	10.14	11.23	10.12	10.25	24.25	5.25	13.22	27.35	15•29		5•6	20.7	25
20	サポートインターフェーフ	11.2	6.10	2·37 6·10	6.10	40·13 28·40	2·27 6·40	27·3 10·35	13·25 13·9	3·10 5·35	2·25 40·33	24·2 23·11	2·27 10·24	35·6 24·5	10·7 5·35	10·9 5·6	10·35 28·25	25·14 26·25	9·19 15·29	5.6	40.33	4·13 16·17	28
20	サポートインターフェース 当男子記得/亜切/	5.9	1.7	26.24	7.26	6.7	10.2	7.24	26.23	33.7	6.10	2.25	25•1	35.25	2.13	38.40	5.7	37.3	10.1	40.33	10.1=	40.13	_
21	消費者所得/要望/ フィードバック	14·13 22·7	7·25 30·21	7·19 21·29	36·13 25·22	4·7 25·40	5·15 35·25	7·13 1·24	13·1 37·17	13·22 7·13	7·5 10·40	10·3 25·5	2·35 13·25	35·13 25·1	25·22 2·35	13·25 39·24	28·25 7·22	24·25 37·3	7·20 24·35	20·7 4·13	16·17 40·13		3.
22	情報量	37·13 25·10	37·25 28·2	7·2 37·20	1·3 10·26	1·6 3·40	13·32 15·23		13·15 23·25	5·25 3·37	2·37 4·13	13·4 28·37	28·35 2·37	28·2 37·32	5·37 15·6	3·6 37·28	10·28 3·25	28·3 17·37	1·2 15·35	25·3 28·35	1·3 37·2	2·29 3·35	
23	 コミュニケーションフロー	6.25	6.18	6.26	30.6	2.6	6.2	6.35	2.37	25.38	2.28	5•25	35.6	6.31	6.16	2.3	10.28	25•1	6.31	29.31	2.3	29.31	
20	システムが受ける	31·29 11·25	37·13 35·27	18·19 26·2	31·4 35·2	35·3 3·26	13·25 22·24	37·18 2·35	18·19 22·35	3·26 35·2	3·37 3·26	23·10 13·17	1.27	25·35 35·3	13·35 2·13	13·4 3·35	37·3 27·35	28·32 1·35	2·35 35·15	6·2 25·35	15·18 11·24	30·7 39·3	22

[Hands-On Systematic Innovation for Business & Management] 2007 by Darrell Mann

40 Inventive Principles

NO	Invention principle				
1	Division (Segmentation)				
2	Separation (Taking Out/Separation)				
3	Local nature (Local Quality)				
4	Asymmetry (Asymmetry)				
5	Annexation (Merging)				
6	Generality (Universality)				
7	Nest ('Nested Doll')				
8	Balance (Counter-Balance)				
9	Advance reaction (Prior Counter Action)				
10	Advance action (Prior Action)				
11	Prior protection (Prior Cushioning)				
12	Removal of tension (Remove Tension)				
13	Reverse-conception (The Other Way Around)				
14	Curved surface (Curvature)				
15	Dynamics (Dynamization)				
16	Many are about slightly, few, and slightly (Slightly Less/Slightly More).				
17	Another dimension (Another Dimension)				
18	Resonance (Resonance)				
19	Periodic action (Periodic Action)				
20	Continuance of useful action (Continuity of Useful Action)				

NO	Invention principle						
21	Fast execution (Hurrying)						
22	The misfortune is changed and it does to [**] (Blessing in Disguise).						
23	Feedback (Feedback)						
24	Mediation (Intermediary)						
25	Self service (Self-Service)						
26	Copy (Copying)						
27	Cheap short longevity (Cheap Disposable)						
28	Another perception substitution of mechanism (Another Sense)						
29	Liquidity air pressure and hydraulic pressure (Fluidity)						
30	It is thin, and it a flexible is flexible husk and thin film (Thin and Flexible).						
31	Porous material (Holes)						
32	Color variation (Colour Changes)						
33	Homogeneity (Homogeneity)						
34	Exclusion and reproduction (Discarding and Recovering)						
35	Change in parameter (Parameter Changes)						
36	Phase change (Paradigm Shift)						
37	Heat relative change expansion (Relative Change)						
38	Strengthened strong [i] oxidant of atmosphere (Enriched Atmosphere)						
39	Calm no revitalization atmosphere of atmosphere (Calm Atmosphere)						
40	Composite structure composite materials (Composite Structures)						

Creation of "New item and service" system [Stage3]

Set of hypothesis of < contradiction solution and "New item and service" system (idea) > case

Characteristic that is improved and improved

A parts supplier overseas (China) at the right time procures parts from the subcontract enterprise in Japan.

⇒13Supply and time

Characteristic in which it conflicts

It takes time from the order of each subcontractor for parts to ordering and the delivery procedure.

⇒27Adaptability/flexibility

Invention principle and subprinciple

Principle 15. Dynamics (Dynamization)
C.If the system the object process is inflexible, it has adaptability and it keeps flexible.

Principle 10. Advance action (Prior Action)

A.The demanded change is introduced into the system or the object (To a partial target enough) before it is needed.

Contradiction solution (idea level)

1 of the parts supplier and the subcontractor into the relation of 1-to-many.

2The receiving order, the collection and delivery, the delivery date, the tariff procedure, and the price payment collection are unified.

3The parts supplier inputs serial numbers of parts necessary for a special system, and it registers, and when ordering, a necessary amount and the delivery date are input.

4. "New item and service" Comparison between system and contradiction settlement plan [verification of hypothesis 1]

Global procurement support system

Yamato HD [EASY] Foreign Japan countries 1)Order **Parts** supplier Subco ntracto **2**..part.. sending out and customs clearance 4)Parts Delivery 3 Price Maior Paying for manufacturi ng

enterprise |

[function]

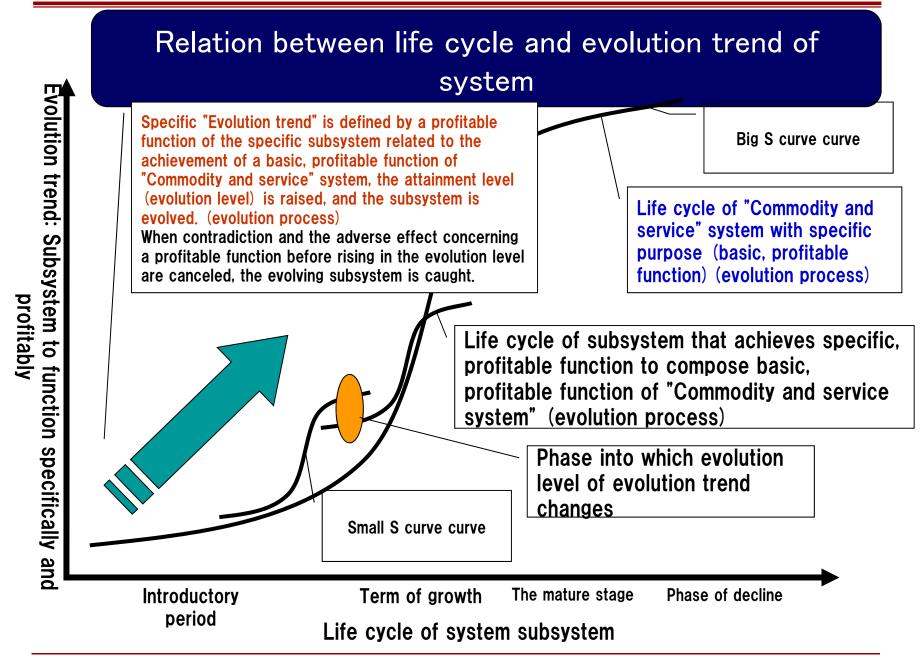
- "Uniform management of receiving order information"
- "Export business and shipping according to marine transport"
- "Customs clearance procedure of importing and exporting"
- "Paying for of parts cost money"

Hypothesis setting (solution of contradiction)

- 1 It changes it from the receiving order for couple 1 of the parts supplier and the subcontractor into the relation of 1-to-many.
- 2 The receiving order, the collection and delivery, the delivery date, the tariff procedure, and the price payment collection are unified.
- 3 The parts supplier inputs serial numbers of parts necessary for a special system, and it registers, and when ordering, a necessary amount and the delivery date are input.

5. Relation between life cycle and evolution trend of system

- Relation between life cycle and evolution trend of system
 - Design of method of medication
- hypothesis 2]..drinking.. verification
 - Analysis of "Commodity and service" system that evolves along evolution level (reverse)



Life cycle of "Commodity and service" system [S curve curve]

- It is thought that the evolution process from the possession also of "Commodity and service" system of similar man's life cycle, and the birth to the disappearance exists.
- The life cycle is displayed by using S curve, and it is called, "S curve curve" usually. A horizontal axis is assumed to be "Time axis" and the function and system characteristics are set to the spindle.
- When the function is taken in the spindle, the "Commodity and service" system to function will improve the ideal according to S curve.
- Specific "Evolution trend" is defined by a profitable function of the specific subsystem related to the achievement of a basic, profitable function of "Commodity and service" system, the attainment level (evolution level) is raised, and the subsystem is evolved. (evolution process)
- When contradiction and the adverse effect concerning a profitable function before rising in the evolution level are canceled, the evolving subsystem is caught.

Evolution							
1. Customer expectation	17.Removal of bound	Evolution trend and					
2. Focus of purchase of customer	18.Trim	evolution level					
3. Recognition to self-assembler	19.Control						
4. Knowledge	20.Hierarchy of needs	·一次産品 ·製品					
5. Ability	21.A decrease in man's	-+ビフ					
6. Process idea	22.Interaction with anot						
7. Strength of system	23.Listen/communication	2. 顧客の購入の焦点					
8. Mono-ivory shell jackrabbit (similarity)	24.Strengthening of asy	•性能					
9. Mono-ivory shell jackrabbit (diversity)	25.Marketing research	・信頼性 ・便利さ					
10.Mono-ivory shell jackrabbit (increase of difference)	26.Adjustment of action						
11.Division	27.Adjustment of rhythn	3. 自己組織化に対する認識 ・自己組織化の無自覚					
12.A decrease in decline	28.Viewpoint of design	自己組織化を自覚ガイドされた自己組織化					
13.Improvement of use of various senses	29.Nonlinear	・自律的な自己組織化					
14.Increase of transparency	30.Structural evolution	・自律的な能力成長(自己創出)					
15.Degree of freedom	31.Improvement of flexi	4. 知識					
16.Connection	32.Vertical/horizontal b	・データ ・情報					
	1	·知識 ·知恵					

Evolution trend: [Hands-On Systematic Innovation for Business & Management]2004 By Darrell Mann

MRA knowledge creation society translation (2007)

Big S curve curve and small S curve curve (example)

The evolution trend is "Aspect of the purchase of the customer. "The definition of the trend (profitable function of the subsystem) is assumed to be "The use level of delivering to home is improved".

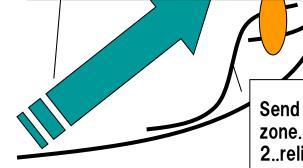
A small S curve curve is formed with the rise of the attainment level of this profitable function "The use level of delivering to home is improved" (evolution level).

"The package is delivered" system as a big S curve curve.

Evolution trend"Aspect of purchase of customer"

- Evolution level 1: Quality
- Evolution level 2: Reliability
- Evolution level 3: Convenience
- Evolution level 4: Price

The receiver cannot stay at home at specified time of the sender and the package is delivered again. The receiver is neither revokable, should not be told the time of delivering to home beforehand, and wait for the receipt time zone. The system "Takkyubin (home delivery service) mail notification service" is developed as a system that solves the contradiction related to the adverse effect that such a present sender specification time zone delivery causes, and the evolution level rises. (..level 3..: convenience.)



Send a package..specification..time..receiver..deliver..time zone..deliver..service..system..level

2..reliability..evolve..system..develop..demand..situation..provide..continue.

Introductory period

Term of growth

The mature stage Phase of decline

Life cycle of system subsystem

[hypothesis 2] verification Analysis of "Commodity and service" system that evolves along evolution level (reverse)

- New item and service" system turned on to the market is caught in the passing age. Those contents raise the evolution level of a specific evolution trend. The event that it is contents obtained by that is found.
- The evolution level of the evolution trend is raised if this can be found and there is a possibility that the hypothesis of contents of the future "New item and service" system can be set.

[hypothesis 2] verification Analysis of "Commodity and service" system that evolves along evolution level (reverse)

- Event that pays attention to evolution trend "Degree of freedom"
 - Definition of evolution trend "Degree of freedom":
 - **★ The connection of the person who is related to the package delivery is expanded**
 - The level of degree of freedom is found and [two degree of freedom], [three degree of freedom], and "Commodity and service" systems that raise it can be found from [one degree of freedom] in the passing age.
 - The following services can be caught by raising degree of freedom as service of delivering to home thought to be a creation.
 - **If the package is delivered by the convenience of the courier service** ("Beginning of delivering to home" in 1976) ⇒

 - # 【 three degree of freedom 】Delivering to home is requested directly from + driver ("Driver direct service" in 2004) ⇒
 - **# If Some State of State of**

"Commodity and service" system that evolves along evolution level (event)

❖one evolution trend 15 "Degree of freedom": 1 degree of freedom ⇒2 degree of freedom ⇒3 degree of freedom

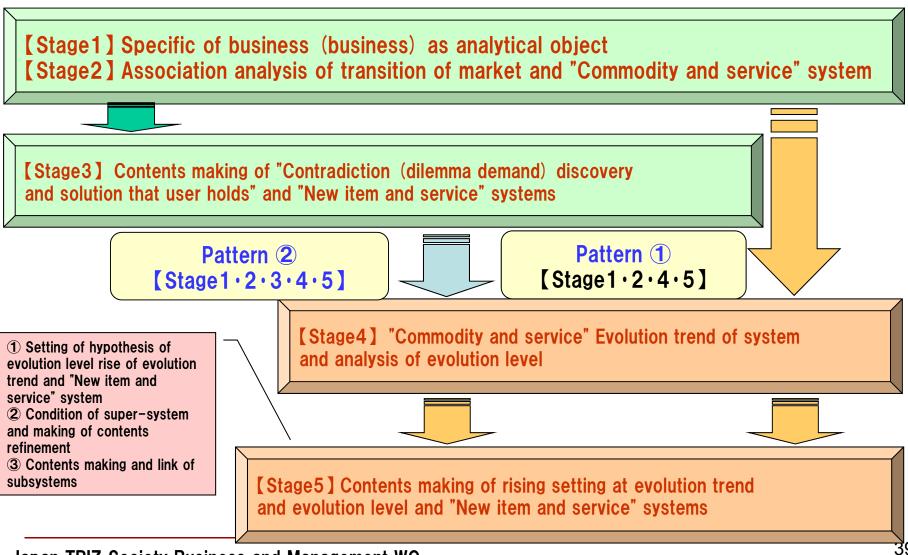
 \bigcirc Related person: Courier service \Rightarrow + those who send it out \Rightarrow + driver \Rightarrow + receiver \Rightarrow +?

進化トレンド 15 自由度	-1つの自由度	・2つの自由度	・3つの自由度	・4つの自由度
開発された商品• サービス	1976年 「宅急便」を開 始(関東一円)	1988年 夜間お届け サービス開始	2004年 ドライバーダイ レクト開始	2011年 震災後、被災 者の避難先ま で配達
		1998年 時間帯お届け サービス開始	2005年 宅急便e-お知 らせシリーズ スタート	Evolution

 \bigcirc Choices of service : Region \Rightarrow + size \Rightarrow + kind \Rightarrow + time \Rightarrow + optional function \Rightarrow +?

進化トレンド 15 自由度	・1つの自由度	•2つの自由度	Evolution	・4つの自由度
開発された商品・サービス	1983年 宅急便エリア 拡大 1997年 全国ネットワー ク完成	1988年 サイズ拡大 1994年 サイズ拡大	1983年 スキー宅急便 1984年 ゴルフ宅急便	1988年 夜間お届け サービス開始 1998年 時間帯お届け サービス開始
	1987年 UPS宅急便 Expansion of commodity and service 宅急便 全国展開			2004年 ドライバーダイ レクト開始

6. Method of approaching "New item and service" system creation with axis in the future



Creation of "New item and service" system [Stage4] "Commodity and service" Evolution trend of system and analysis of evolution level

- To which trend of the evolution trend of 32 (Darrell Mann advocacy) did the settlement plan of the contradiction caused by no adjustment of "Commodity and service" system and needs of the user offered to the market pay attention? Moreover, at which evolution level the target was squeezed is examined.
- The relating evolution trend was selected from the function and the characteristic related to the achievement of "Commodity and service" system. Moreover, the meaning of the evolution trend is defined.
- How the meaning of an individual trend of evolution is defined becomes a key.
- The assumption of the evolution level is different according to the definition of the evolution trend.
- - ❖ The evolution trend that extracts the function and the characteristic from "Commodity and service" system that has already been offered to the market and corresponds is specified.
- - It was able to be confirmed that the idea of the contradiction solution was effective for the formation of the concept of "New item and service" system. The evolution trend that extracts the function and the characteristic from the idea of this contradiction solution and corresponds is specified.

Creation of "New item and service" system [Stage4] Evolution trend and level (analysis) of "Commodity and service" system of <> cases

The order was received and ..[.. integrated with transportation, the delivery, and the tariff procedure.

Global procurement support] System (present)

[specified evolution trend]

- 2. Focus of purchase of customer
- 4. Knowledge
- 17. Removal of boundary
- 21. A decrease in man's relations
- 26. Adjustment of action



[content of definition of evolution trend]
Definition:[Service is bought]

Definition: Information is united with distribution 1

Definition: [The range of transportation is expanded]

Definition: [Human work is reduced]

Definition: The purchaser is adjusted with the order person's behavior I

[specified evolution level]

Level 3[convenience]

Level 3 knowledge]

Level 2[small number of limits]

Level 4[man + automation tool]

Level 2[partial adjustment action]



[content of definition of evolution level]

Definition: [It receives and integrated service of the order and distribution is performed]

Definition: [Receiving order information and distribution information have been integrated]

The definition: The hub function of the parts supplier and the subcontract enterprise is made.

[Teiru]]

Definition: [Individual receiving ordering is automated]

Definition: [It is ..delivery date management of distribution.. thorough]

Creation of "New item and service" system [Stage5] Contents making of rising setting at evolution trend and evolution level and "New item and service" systems

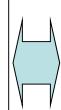
- 1 Setting of hypothesis of evolution level rise of evolution trend and "New item and service" system
 - The content of the definition of a high-ranking level is decided by applying the evolution trend to the settlement plan of the contradiction caused by no adjustment of "Commodity and service" system and needs of the user offered to the market, specifying the evolution level, and raising the evolution level.
 - And, contents of "New item and service" system are created by combining content of the definition, and making it to the refinement.

Creation of "New item and service" system [Stage 5]
Rise of < evolution level and "New item and service" Creation (development) > case with system

[global procurement support that receives and integrates order with transportation, delivery, and tariff procedure]Evolution system of system

[specified evolution trend]

- 2. Focus of purchase of customer
- 4. Knowledge
- 17. Removal of boundary
- 21. A decrease in man's relations
- 26. Adjustment of action



[content of definition of evolution trend]
Definition: [Service is bought]
Definition: [Information is united with distribution]
Definition: [The range of transportation is expanded]
Definition: [Human work is reduced]
Definition: [The purchaser is adjusted with the order person's behavior]

[evolution level of title]

Level 4[price]

Level 4[wisdom]

Level 3[boundary none]

Level 5 automation tool

Level 3[complete adjustment action]



【 content of definition of evolution level 】

Definition: The price is set according to the amount of the treatment]

Definition: The possibility of procurement is forecast

Definition: The delivery date has been shortened by automatic optimization of the delivery route.

Definition: The supply chain is surely secured]

[global procurement support that receives and integrates order with transportation, delivery, and tariff procedure] Evolution system of system (case)

< hypothesis setting ("New item and service" system) by raising level of evolution trend >
Securing of new supply chain when supply chain cuts it due to unexpected accident. And, the delivery of a new procurement destination is served to the customer for it for the dissemination and a short time.

In the consideration case,

- Trend 4(knowledge) was defined in level 4 as (wisdom) and (The possibility of procurement is forecast). Moreover, trend 26(adjustment of the action) was defined in level 3 as (complete adjustment action) and (The supply chain is surely secured).
 - The process of the pr
- Trend 17 removal of the boundary] was defined in level 3 as [the boundary none] and [The transportation networks in the sea, empty, and the land have been integrated]. Moreover, trend 21 decrease in relations with man] was defined in level 5 as [automation tool] and [The delivery date has been shortened by automatic optimization of the delivery route].
 - System that secures the delivery net for a short time by automatic optimization of integration and the delivery route of the transportation network can be assumed from these.
- Some scenarios are made in consideration of the content of the definition, and it evaluates and it will select it like this.

Creation of "New item and service" system [Stage5] Contents making of rising setting at evolution trend and evolution level and "New item and service" systems

2Condition of super-system and making of contents refinement

- The future change factor of a super-system is found.
- The condition of the market (super-system) because of the idea (system) that waits for commercialization being made an embodiment (characteristic) is found.
- The achievement condition of "New item and service" system is set from the condition of the market.
- The hypothesis of "New item and service" system is made a refinement.

Creation of "New item and service" system [Stage5] Contents making of rising setting at evolution trend and evolution level and "New item and service" systems

3Contents making and link of subsystems

- To achieve contents of "New item and service" system for the next term, the evolution of the subsystem as the relating subordinate position structure is demanded. The subsystem that should be evolved is specified, and the possibility of achievement will be examined.
- In the case, the following content is thought as a subsystem that should be examined.
 - Accumulation of investigation of part procurement destination by the country for supply chain securing and foreign countries and technical intelligence and maintenance of information network
 - Maintenance of distribution net and physical distribution base
 - Construction of transport links forecast system

Creation of "New item and service" system [Stage4.5] Rise of < evolution level and "New item and service" Creation (development) > case with system

Global procurement support system that receives and integrated order with transportation, delivery, and tariff procedure

Setting of hypothesis of the future "New item and service" system created from evolution trend (idea level)

[The evolution trend is an evolution trend of 32 of Durrell man]

[direction of forecast evolution (evolution to high-ranking level)]

2. The focus of the purchase of the customer buys service.

Convenience performs integrated service of receiving and the order and distribution in level 3 The price is set by four ⇒ level prices according to the amount of the treatment.

4. The knowledge information and distribution are united.

Knowledge has integrated receiving order information and distribution information in level 3 The possibility of procurement is forecast by four ⇒ level wisdoms.

17. The removal of the boundary expands the range of transportation.

Level 2..small number of..limit..parts supplier..subcontract..enterprise..hub..function..level..boundary..sea..land..transportation network..integrate. It is made.

21. A decrease in man's relations reduces human work.

Five ⇒ level automation man + automation tool tool that automates individual receiving ordering has shortened the delivery date in level 4 by automatic optimization of the delivery route.

26. The adjustment of the action adjusts the behavior of the purchaser and those who receive an order.

The partial adjustment action persists in the delivery date management of distribution in level 2 ⇒ level 3 complete adjustment action surely secures the supply chain.

< hypothesis setting ("New item and service" system) by raising level of evolution trend >
New supply chain when supply chain cuts it due to unexpected accident Securing. Delivery service of new procurement destination for dissemination and a short time to customer for it

Construction of subsystem

- 1.Accumulation of investigation of part procurement destination by the country for supply chain securing and foreign countries and technical intelligence and maintenance of information network
- 2.Maintenance 3 of distribution net and physical distribution base. Construction of transport links forecast system

7. Approach for fiscal year 2014 to deepen content of frame of "New item and service" system creation

An explanation of the content of the definition of the evolution trend of the Darrell Mann advocacy and the content of the definition of the evolution level as comprehensible as possible is made.

(evolution trend explanation of 32: Business and chapter of management TRIZ research subcommittee meeting)

- "Evolution trend explanation of 32: the business and the chapter of management TRIZ research subcommittee meeting" is applied to some "Commodity and service" systems of "Business of delivering to home" taken up by this analysis, and the refinement of the content of the explanation and the method of medication is aimed at.
- As a result, contents of the frame of "New item and service" system creation presented this time are deepened.

How about joining the Business and Management TRIZ Research Subcommittee?

- Please participate in the research subcommittee meeting, and present various topics of research.
 - The theme that researches can be brought in without reserve.
 - The research area and the theme extend naturally if the number of members increases.
- There is a result outlet of research activities, and the business use of the result can be expected.
 - Because it is a cooperation of labor research, awareness and a new finding can be expected to be obtained.
 - Study results can be announced in the TRIZ symposium.
 - Can it notice during the research, and the use of cultivated TRIZ idea and tool to practice be expected.
- About the management of the society
 - Member individual's result of review and idea are brought together in the meeting.
 - It becomes a meeting at half a day once every 1-2 months.
 - A basic venue becomes Tokyo.
 - The inquiry concerning the research subcommittee meeting
 Thank you very much even to Japanese TRIZ society (info@triz-japan.org).

Thank you for your attention

Business and Management TRIZ Research Subcommittee

Japan TRIZ society, NPO