

SEEKING IDEAL COOPERATION IN JOINT VE

(In Product Planning Stage)

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K. Matsui worked centering on VE for 15 years for Shatai Kogyo, a truck cab maker, and now working for Isuzu after Shatai kogyo merged with Isuzu in May 1994. He was certified as CVS in 1990 and is energetically promoting VE activity and training young people. What allowed this paper to be issued is the exchange of true intentions concealed before the merger of ISZ and SKK. IF the merger had not been carried out, this paper would not have been made.



Yoshihiko Sato, CVS, is General Manager and Cost Management Specialist at Product Planning Office, Research Engineering Division of ISUZU MOTORS LTD. Since he joined Isuzu so young upon graduation from the Kanagawa Engineering High School, Mr.Sato has steadily advanced his career in production technology, cost planning, and now VA/VE promotion. He develops and implements VE plans for product development, and is now Chief VE instructor for Isuzu and its affiliated companies. He heads a group of researchers and is credited with the unique "Product Tear Down Method" which is widely recognized in Japanese manufacturing industry. He is one of the sustaining members of SJVE.

ABSTRACT

This paper reports a joint VE as it should be to achieve an efficient VE carried out by a supplier and a car maker in mutual confidence in the current Japanese car industry in which specialized suppliers and makers share the work stages from parts manufacture through final assembly of automobiles. It reveals the difference in interests between the purchaser and supplier and discusses what an efficient joint VE should be like.

Views of joint development from two standpoints, one from the supplier and the other from car maker, are presented and what should be done for a successful joint VE is discussed from the two standpoints.

This paper is made on the basis of the experience of a supplier and a maker later merged into one company.

INTRODUCTION

Japanese automobile industry consists of core automobile assembling makers, around which many part suppliers operating in tiers to support the core. therefore, successful joint VE activity by supplier and maker is a critical factor to produce high-quality and low-cost vehicles. (See Fig.1)

On the other hand, the maker and the supplier stand opposite each other in seller-purchaser relation, which may prevent them from reaching the best optimization in the automobile engineering.

In the car industry mentioned above, the authors, Y. Sato and K. Matsui were working for Isuzu Motors (purchaser) (ISZ) and Shatai Kogyo (supplier) (SKK) respectively and gained experience in the joint VE activities conducted before the merger of their companies in 1994.

After the merger, they have worked together to disclose the truth of the joint VE activities they have been involved in when they were in their former companies, and now they present here the truths and points for efficient joint VE activity and what a joint VE should be like.

RELATION BETWEEN SELLER AND PURCHASER

In the joint VE cases which were analyzed for this report, SKK shared the work from the designing to the production of all of the cabs for trucks manufactured by ISZ.

This SKK's involvement in ISZ's operation seemed to prevent ISZ from changing supply sources in short-sighted policy, thus providing a long-term joint VE environment. (Generally, joint VE scope and responsibility sharing are largely dependent on what relationship is established between the seller and purchaser.)

OUTLINE OF DEVELOPMENT PROCESSES

Outline of the ISZ's development processes are shown in Fig.2

In the stages of a development plan from establishing product strategy to finalizing product concept, suppliers of major parts offer to participate in the development plan. The cabin supplier used to be the first to come into the plan because the cab of a truck is as important as the face of a man.

In the stages of target price setting and creation of more practical concept in which the target price is taken into account, parts suppliers are selected and they begin to participate in joint development.

Joint VE applies to the development activity in these stages and onward. In the next stages, prototype part-making begins in accordance with drawings.

Joint VE achievements are built into the engineering prototype parts which are made to evaluate the potential of the product, and are also reflected in the activities of the pilot production stage in which productivity and quality are checked, and here joint VE activity almost comes to the end.

Through the stages mentioned above, all problems are to be solved and then marketable products are to be manufactured.

DIFFICULTIES ENCOUNTERED IN JOINT VE AND ACTION TO BE TAKEN TO OVERCOME THEM

This paper is centered on the development stages from the product planning to the engineering proto-

type work because joint VE is expected to be most effective in these stages.

Product Planning

ISZ's standpoint: ISZ's standpoint is customer-oriented.

The Cab is the chief attraction of model change and thus ISZ hopes to develop new cabs which lead all competitors and free from all problems left in old cabs. Further, ISZ has the intention to use the latest technology and materials in pursuing this goals.

SKK's standpoint: SKK thinks the same way in the customer-oriented attitude as Isuzu, having its own prospect of the future cabs into which its specialized technology is to be built.

However SKK must compromise with reality on such matters as productivity-related problems, fear of production transfer to overseas plants, etc.

Joint VE

The product concepts presented by both ISZ and SKK are, for the most part, incorporated into an ideal cab concept, marketability of which is agreed upon between ISZ and SKK.

ISZ is fearful, at bottom, of the SKK's failure in bringing the ideal cab into reality but does not expressly say so.

And SKK thinks that the goal can be achieved because VE has been carried out and the remaining technological and financial problems can be solved by future studies and ISZ's assistance.

Development goes past this stage with fear and problems remaining, while both ISZ and SKK are laying their hope of success on each other.

What a joint VE should be like:

Move to gain one's advantage in negotiation in this stage may cause the truths to be concealed so that the future joint activities will go on under double standards, one expressly shown but the other concealed.

Therefore, in this stage, both parties must have a common understanding of the supplier's profit and the corrective actions to be taken if a possible failure becomes a reality.

Thorough discussion must be done on their (ISZ and SKK) technological capability, available facilities and the amount of money that can be invested, in particular.

Sharing Common Targets

ISZ's standpoint:

ISZ presents profitable target price set with reference to good selling vehicles as controlling samples. The target price means that a cab should be produced at that price or lower, otherwise it will not sell.

However, acceptable reasoning for the price is not given and little consideration is given to the feasibility of cab production at such a price whereas specification lists include new items.

SKK's standpoint:

SKK submits to ISZ an estimate which SKK thinks is reasonable but ISZ says that SKK's estimate is far off the target while giving no acceptable account for the difference between the estimate and target.

SKK is likely to suspect that ISZ has given a stricter than necessary target to SKK taking advantage of SKK's remoteness from the process of setting the target in ISZ.

Based on the suspicion above, SKK will concentrate their efforts on persuading ISZ that SKK's estimate is reasonable and that the target price should be raised.

Joint VE:

ISZ's target price is decided on the basis of the business request for marketing vehicles without taking SKK's request into consideration.

SKK presents costs which will be attainable with expected improvements in the production stage.

The target price and presented cost level are only understood mutually by the both parties but the difference between them is not narrowed, while starting work alone is agreed upon because of tight schedule.

What a joint VE should be like:

Sharing common targets is the first step in a successful joint work.

A purchaser should be so capable as to have suppliers accept the purchaser's requests for targets

by providing the supplier with reliable support to the targets but not by merely forcing ideals on the supplier. A supplier should make challenging targets when they are offered on a reasonable ground.

The supplier must well understand that targets should not be easily changed and that, if the supplier fails to achieve the targets, purchasing orders will stop coming in sooner or later.

The first step of a joint work is to bring about harmonization, mutual confidence and challenging spirit, without which no joint VE can be successful.

Finalizing Details of Concept

ISZ's standpoint:

ISZ presents specifications in detail, such as room illuminance shown in lux and seat surfacing of specific material (cloth or PVC), which are likely to be at a level higher than feasible because of ISZ's expectation that SKK, being a specialized supplier, can find some way to reach the goals.

SKK's standpoint:

Designing starts with a gap left between the required level and the feasible level, therefore a high-cost design results to meet ISZ's requirements but a design to limit costs within targets cannot meet ISZ's requirement. This designing environment aggravates SKK's frustration because SKK's intention of front loading cannot be achieved. Designing work continues to proceed toward part integration into an entire product in the latter stage of the development.

Joint VE:

From the presented specifications in detail, the gap between ISZ's expectation and SKK's view of feasibility is clearly identified but it is not part of the feasibility study and the development goes into the next stage. The gap continues to be left as an obstacle in the subsequent stages. ISZ anticipates that SKK, being a specialized supplier, can find some way to reach goals and SKK is in fear of failing to achieve target price while complying with the specifications.

What a joint VE should be like:

Basically, all specifications should be translated into numerical values which are completely agreed upon by both parties.

Purchaser and supplier should work in co-operation to devise construction and systems at the lowest costs.

Funds should be reserved for uncertainties in the specifications.

In this stage, the overall design should be examined to decide which of the cab characteristics will be given primary stress to take a leading position among competitors in the market (although people are apt to ask for perfection). Proper selection is an important aim of VE application.

Engineering Prototype Work (Preparing drawings / Taking action against failure)

ISZ's standpoint:
Specifications and cost targets are established and the first prototype is made under ISZ's expectation that SKK will successfully materialize the severe requirements in the prototype.

Failure to meet requirements is unavoidable and SKK's report says that problems originating in vehicle construction cause poor cab productivity. However, available time is not enough to make permanent correction because the highest priority is given to integrate details into an entity. Therefore corrective action is left to the discretion of SKK.

SKK's standpoint:
Trial cab is made on schedule and there are many well educated value engineers with CVS's taking the lead, while SKK is left unsatisfied with the target costs which are not achieved, even with all of SKK's techniques.

SKK staff must make their way energetically through this stage as assembly problems occur in production line and requests come from ISZ for additional specification items.

Joint VE:

Cooperation of ISZ and SKK is limited only to temporary correction because both companies are in the most busy stage of the development.

Discussion on responsibility sharing comes first and cooperation for cost reduction can hardly advance although this stage is the last chance to hit the remaining cost targets.

What a joint VE should be like:

Drawing quality improvement is important to pass on no problems to subsequent stages.

Application of VE and DFA, although it may cause drawing release to delay, will improve drawing quality and result in less confusion in the downstream processes, thus achieving overall improvement in development efficiency.

CONCLUDING REMARKS

Starting cooperation with trustworthy partners in the earliest stage is the key to efficient business operation in the present specialized society.

Japanese manufacturing industries are on the way to more specialization and more cooperation with partners having their own specialties not only in the home but also in overseas countries. Conventional relationship between high-handed manufacturers and subjected suppliers will lead to inefficiency in business operation.

Joint VE is increasingly in need for Japanese manufacturing industries in current business environment.

Joint VE with foreign businesses is believed to provide Japanese industries with the power to overcome high yen appreciation and compete with overseas industries, and thus Japanese businesses will be established as competitive multinational enterprises.

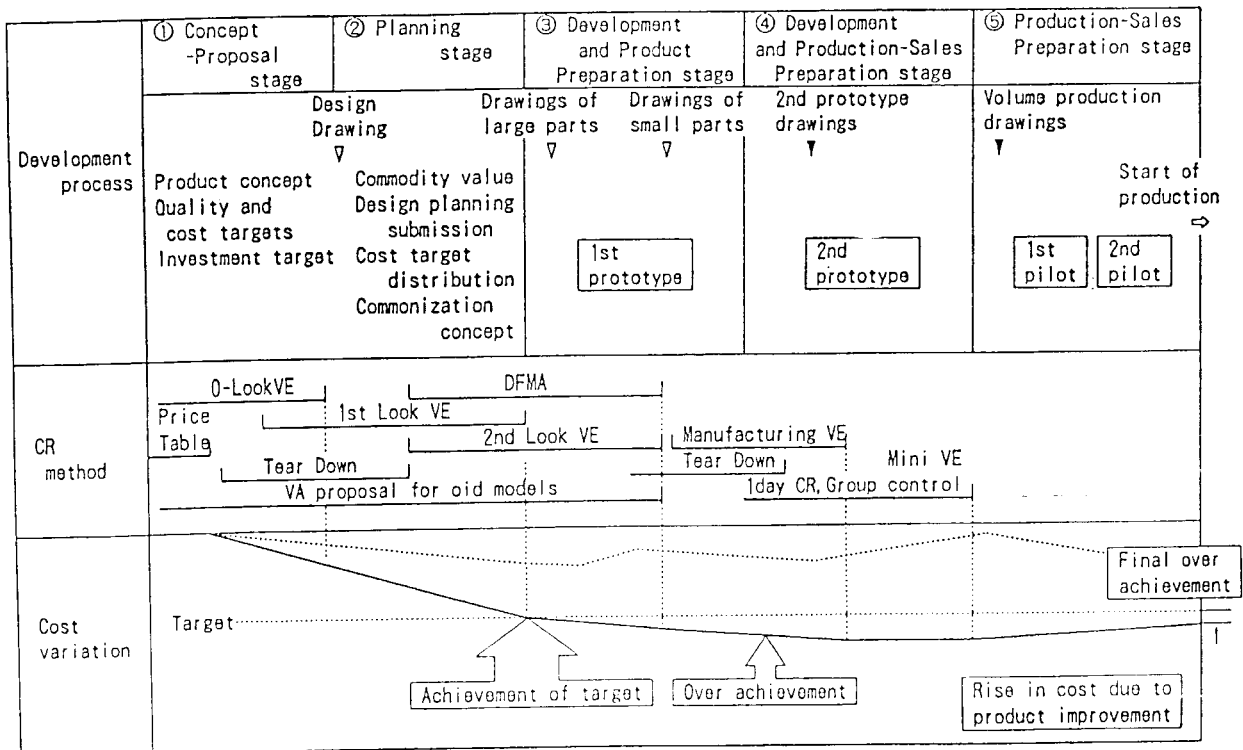
Joint VE processes are summarized in "Approach to Target via. Joint VE" (See Fig. 3).

Job Sharing Between Car Makers and Supplier

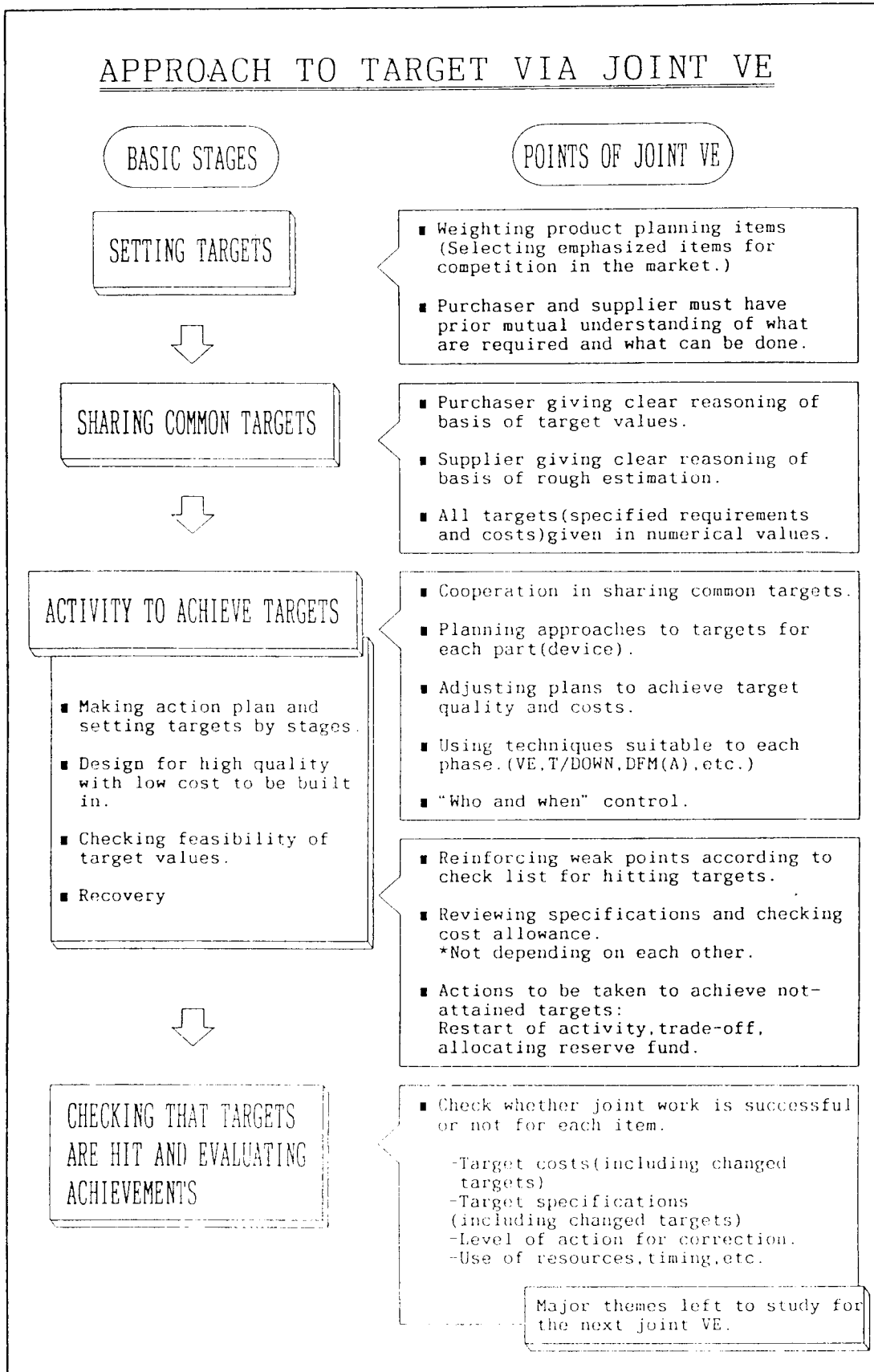
Relation Ship A>B>C>D

Job		Marker	Car Maker	Supplier		
				Big	Mid	Small
Development	Marketing		A	A	B	D
	Basic Research		A~B	A	C	D
	Product Planning		A~B	A	C	D
	Product Development (Prototype)		B~A	A	B~A	D
	Design		B~A	A	A	B~C
	Proto Working		B	A	A	B
	Experiment		A~B	A	A	C
Production	Jig & Die Design		A (In House)	A	A	B~D
	Jig & Die Preparation		A (In House)	A	A	B~D
	Production		A (In House)	A	A	A
Improvement	Product Improvement		B~A	A	A	C~B
	Improvement in Production Method and Process		A (In House)	A	A	B~D
	Improvement in Logistics		A (In House)	A	A	B~D
	Quality Improvement		A (In House)	A	A	B~D

- Fig. 1 -



Standard development stage -Fig.2-



-Fig. 3-