

Evaluation of Strategic Success Factors on Performance of an Automobile Manufacturing Unit

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Abstract

This research tries to identify the strategic success factors in automobile and auto-component manufacturing units in North India; to examine the effect of these factors on competency factors and performance parameters of the manufacturing unit. Data has been collected from 118 automobile and auto-component manufacturing units. A questionnaire has been prepared to conduct survey in these companies. Multiple Linear Regression analysis, F-test and t-test have been employed to analyze the factors. In this paper models for various performance parameters with strategic success factors in automobile and auto-component manufacturing units have been developed. The effect of strategic success factors over performance factors has also been examined. The research has been carried out in the automobile sector in North India. Future research can be conducted in other parts of the country. Performance of automobile manufacturing unit can be related to other factors. The paper identified which strategy factors of organizations in manufacturing are required, and how to balance these factors with competencies and performance factors. The study allows linking of strategy factors to a number of parameters and roles that are required at different stages in society such as sales, customer base, etc. This research reveals new insights about the strategic success factors. This research has also evaluated the relation of these factors on manufacturing competency factors and other performance parameters in automobile and auto-component manufacturing units.

Keywords: Manufacturing Competency, Strategic Success, Performance Parameters, Automobile Units.

Introduction

Securing competitive advantage is a challenging task that must constantly be addressed in new and innovative ways. A competitive advantage exists when a firm's distinctive competencies match up with the success requirements of the business opportunity better than the competencies of the competitors Jeffrey [77]. Strategies are the means by which long term objectives will be achieved. Business strategies may include geographical expansion, product development, market penetration, etc. Strategies are potential actions that require top management decisions and large amounts of firm's resources. Strategies have multifunctional consequences and require consideration of both the external and internal factors facing the firm [108]. Strategy is both proactive and reactive. An organization's strategy consists of actions and business approaches management employs to achieve the targeted performance. A company's strategy is dynamic, emerging in bits and pieces as the enterprise develops, always subject to revision whenever managers see avenues for improvement. A company's actual strategy is partly planned and partly reactive to changing circumstances [109].

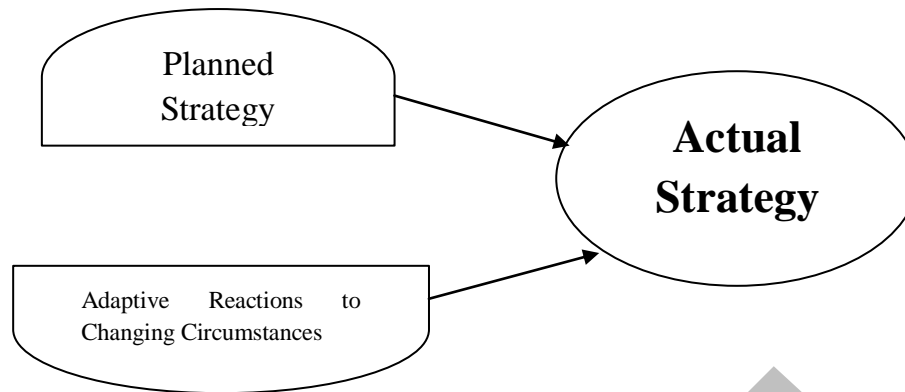


Fig. 1 Actual Strategy framework [109]

Product development is a strategy that seeks increased sales by improving or modifying present products [108]. In case of automobile segment, the strategic objective could be to satisfy the customers by providing quality vehicles, developing new products, reducing the time it takes to bring new vehicles to market [109].

Literature Review

[81] Examined various issues in context of Indian SSIs such as nature of pressures and constraints, competitive priorities, competencies development, areas of investment, and their relationship with performance. Organizations should develop their strategies after analyzing business environment and SSIs should utilize their resources judiciously.

Conceptualize a learning-based technology strategy along three dimensions: proactive technology posture, process adaptation and experimentation, and collaborative technology sourcing; also to investigate their relationships with plant competitiveness (cost, quality, delivery, flexibility, and innovation). Many plants develop some aspects of a learning-based technology strategy while paying little or no attention to the rest [82].

According to [85], strategic thinking involves two distinct thought processes: planning and thinking. Planning concerns analysis, this involves establishing and formalising systems and procedures whereas thinking involves synthesis – encouraging intuitive, innovative and creative thinking at all levels of the organisation. [54] demonstrates the importance of the resource-based theory of competitive advantage, new product development cycle time as a determinant of export involvement, and competitive advantage for firms which pursue international opportunities. It suggests that product development capabilities are not a critical determining factor of the level of export involvement. The findings show that the ability to develop competitive products faster than competitors is a prerequisite for export involvement. It has been suggested that the fundamental question in international marketing strategy formulation is, “How can the firm achieve and sustain competitive advantage?” An important breakthrough in understanding the concept of competitive advantage is the development of the resource-based theory of competitive advantage. Resource-based theory contends that competitive advantage is gained through the possession and deployment of unique combinations of resources within a firm. These unique combinations of resources allow firms to develop distinctive competencies or capabilities [53]. It is these competencies that then enable the firm to successfully pursue various marketing strategies. In this case, it is both the competency of rapid new product development and international market development through exporting. These competencies place the firm in a strong position relative to its competitors. The synergistic combination of these internal resources becomes the basis of the firm’s export performance and marketing strategy. [87] proposes a fit manufacturing paradigm which integrates the manufacturing efficiencies achieved through Lean and Agility with the need to break into new markets through effective marketing and product innovation strategies to achieve long term economic sustainability. Manufacturing strategies such as Lean and Agility allow companies to deliver bottom-line savings in production terms, although their effectiveness depends upon the volume and demand profile of their products. The trend towards mass customization requires companies to provide personalized products and services at mass production prices. This now places a further burden on companies and

therefore a holistic manufacturing framework must be developed in order to ensure that the factory of the future is able to meet this new demand.

The need to align Knowledge Management strategy with business strategy was identified as critical to the success of Knowledge Management. The paper identifies that this strategy is adding value to the organization and increasing knowledge flows across a dispersed and distributed work environment [94]. The primary aim of strategy is to be different rather than better. Better operational effectiveness can indeed confer a temporary advantage, but this is much more easily matched by competitors than is a distinctive strategic positioning. To replicate a strategy, competitors will have to change their game in ways that are likely to leave them conflicted and unfocused [95]. [100] presented a model that includes the content and process of operations strategy, using top-down and resource-based approaches. This model associates alignment with organizations performance, a subject that has been considered as one of the major and challenging issues in the strategic management efforts. Overall, a new and innovative model has been proposed here for building a vertical alignment between the strategies of the firm. [102] highlighted the important factors that affect the process of aligning the Project Management (PM) to the business strategy. The companies that have strong alignment between the business strategy and the PM show successful projects outcome while the companies that have mismatch alignment show less successful projects outcome. This paper helps the companies to implement their business strategies with embedding their projects in the overall strategy. Also, helps the PM team to execute the projects in a strategic way.

Factors

Based on the literature studied, following factors have been finalized:

Manufacturing Competency Factors

- Product Concept
- Product Design & Development
- Process Planning
- Raw Material & Equipment
- Production Planning & Control
- Quality Control

Strategic Success Factors

- Strategy Agility
- Management
- Team Work
- Administration
- Interpersonal

Output Factors

- Production capacity
- Production time
- Lead time
- Quality
- Reliability
- Productivity
- Growth and expansion
- Competitiveness (or competition)
- Sales (annually)
- Profit (annually)
- Market Share
- Customer Base

Regression Analysis: Impact of the Strategic Success over the Manufacturing Competency

Multiple linear regression model was applied in this section to develop the mathematical model in between the dependent variable as all parameters of the manufacturing competencies and independent variable as all the parameters of the strategic success. The mathematical model develop were each unique for all the parameters of the manufacturing competencies. ANOVA analysis was also performed for the significances of the regression model and the significances of the independent parameters were identified with the t test for the regression coefficients.

Table 1: Regression Analysis of the Product Concept as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | t | Sig. |
|------------------|------------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | 1.992 | .860 | | 2.315 | .022 |
| Strategy Agility | .324 | .101 | .296 | 3.199 | .002 |
| Management | .002 | .091 | .002 | .020 | .984 |
| Team Work | .517 | .110 | .762 | 4.682 | .000 |
| Administration | .305 | .177 | .206 | 1.723 | .088 |
| Interpersonal | -.351 | .088 | -.454 | -4.006 | .000 |

The regression analysis showed that product concept was significantly affected by the strategy agility, team work and interpersonal parameters of the strategic success. The regression model was significant as $F = 55.41$, $p < 0.05$. The model develop explains the 71.0% of the information about the dependent variable.

Table 2: Regression Analysis of the Product design & development as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | t | Sig. |
|------------------|------------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | -1.426 | .915 | | -1.559 | .122 |
| Strategy Agility | .314 | .108 | .217 | 2.915 | .004 |
| Management | .134 | .097 | .132 | 1.377 | .171 |
| Team Work | .396 | .117 | .442 | 3.380 | .001 |
| Administration | .477 | .188 | .244 | 2.538 | .013 |
| Interpersonal | -.085 | .093 | -.083 | -.909 | .365 |

The regression analysis showed that product design and development was significantly affected by the strategy agility, team work and administration parameters of the strategic success. The regression model was significant as $F = 96.61$, $p < 0.05$. The model develop explains the 81.0% of the information about the dependent variable.

Table 3: Regression Analysis of the Process Planning as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | t | Sig. |
|------------------|------------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | 1.766 | 1.105 | | 1.597 | .113 |
| Strategy Agility | .162 | .130 | .111 | 1.247 | .215 |
| Management | .045 | .118 | .044 | .381 | .704 |
| Team Work | .540 | .142 | .596 | 3.809 | .000 |
| Administration | .683 | .227 | .345 | 3.008 | .003 |
| Interpersonal | -.231 | .113 | -.223 | -2.052 | .043 |

The regression analysis showed that process planning was significantly affected by the team work, administration and administration parameters of the strategic success. The regression model was significant as $F = 70.63$, $p < 0.05$. The model develop explains the 73.0% of the information about the dependent variable.

Table 4: Regression Analysis of the Raw Material & Equipment as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | t | Sig. |
|------------------|------------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | -.423 | .549 | | -.771 | .442 |
| Strategy Agility | .267 | .065 | .266 | 4.133 | .000 |
| Management | -.023 | .058 | -.033 | -.398 | .692 |
| Team Work | .480 | .070 | .772 | 6.817 | .000 |
| Administration | .261 | .113 | .193 | 2.317 | .022 |
| Interpersonal | -.184 | .056 | -.259 | -3.291 | .001 |

The regression analysis showed that raw material and equipment was significantly affected by the strategy agility, team work, administration and interpersonal parameters of the strategic success. The regression model was significant as $F = 136.08$, $p < 0.05$. The model develop explains the 86.0% of the information about the dependent variable.

Table 5: Regression Analysis of the Production Planning as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | t | Sig. |
|------------------|------------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | .948 | .633 | | 1.499 | .137 |
| Strategy Agility | .224 | .074 | .208 | 3.013 | .003 |
| Management | -.145 | .067 | -.192 | -2.153 | .034 |
| Team Work | .371 | .081 | .554 | 4.574 | .000 |
| Administration | .407 | .130 | .279 | 3.136 | .002 |
| Interpersonal | .083 | .064 | .109 | 1.287 | .201 |

The regression analysis showed that production planning was significantly affected by the strategy agility, management, team work and administration parameters of the strategic success. The regression model was significant as $F = 115.08$, $p < 0.05$. The model develop explains the 83.0% of the information about the dependent variable.

Table 6: Regression Analysis of the Quality Control as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | t | Sig. |
|------------------|------------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | -1.014 | .666 | | -1.522 | .131 |
| Strategy Agility | .307 | .078 | .280 | 3.916 | .000 |
| Management | -.168 | .071 | -.218 | -2.372 | .019 |
| Team Work | .161 | .085 | .236 | 1.883 | .062 |
| Administration | .426 | .137 | .287 | 3.116 | .002 |
| Interpersonal | .297 | .068 | .382 | 4.378 | .000 |

The regression analysis showed that quality control was significantly affected by the strategy agility, management, administration and interpersonal parameters of the strategic success. The regression model was significant as $F = 106.08$, $p < 0.05$. The model develop explains the 82.0% of the information about the dependent variable.

Regression Analysis: Impact of the Strategic Success over the Output

Multiple linear regression model was applied in this section to develop the mathematical model in between the dependent variable as all process of output and independent variable as all the parameters of the strategic success. The mathematical model develop were each unique for all the process of the output. ANOVA analysis was also performed for the significances of the regression model and the significances of the independent parameters were identified with the t test for the regression coefficients.

Table 7: Regression Analysis of the Production Capacity as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | T | Sig. |
|------------------|------------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | 1.027 | .242 | | 4.245 | .000 |
| Strategy Agility | .155 | .028 | .660 | 5.442 | .000 |
| Management | -.058 | .026 | -.355 | -2.267 | .025 |
| Team Work | .060 | .031 | .409 | 1.919 | .058 |
| Administration | -.038 | .050 | -.119 | -.758 | .450 |
| Interpersonal | .016 | .025 | .099 | .665 | .508 |

The regression analysis showed that production capacity was significantly affected by the strategy agility and management parameters of the strategic success. The regression model was significant as $F = 22.5$, $p < 0.05$. The model develop explains the 50.0% of the information about the dependent variable.

Table 8: Regression Analysis of the Production Time as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | T | Sig. |
|------------------|------------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | 1.027 | .242 | | 4.245 | .000 |
| Strategy Agility | .155 | .028 | .660 | 5.442 | .000 |
| Management | -.058 | .026 | -.355 | -2.267 | .025 |
| Team Work | .060 | .031 | .409 | 1.919 | .058 |
| Administration | -.038 | .050 | -.119 | -.758 | .450 |
| Interpersonal | .016 | .025 | .099 | .665 | .508 |

The regression analysis showed that production time was significantly affected by the *strategy agility* parameters of the strategic success. The regression model was significant as $F = 22.1$, $p < 0.05$. The model develop explains the 50.0% of the information about the dependent variable.

Table 9: Regression Analysis of the Lead Time as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | T | Sig. |
|------------------|------------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | .405 | .282 | | 1.438 | .153 |
| Strategy Agility | .035 | .033 | .143 | 1.055 | .294 |
| Management | .122 | .030 | .716 | 4.087 | .000 |
| Team Work | -.063 | .036 | -.416 | -1.742 | .084 |
| Administration | .022 | .058 | .067 | .379 | .705 |
| Interpersonal | .019 | .029 | .109 | .657 | .513 |

The regression analysis showed that lead time was significantly affected by the *management* parameters of the strategic success. The regression model was significant as $F = 13.4$, $p < 0.05$. The model develop explains the 36.0% of the information about the dependent variable.

Table 10: Regression Analysis of the Quality as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | T | Sig. |
|------------------|------------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | .945 | .221 | | 4.285 | .000 |
| Strategy Agility | .137 | .026 | .607 | 5.288 | .000 |
| Management | -.066 | .023 | -.414 | -2.794 | .006 |
| Team Work | .057 | .028 | .408 | 2.024 | .045 |
| Administration | .059 | .045 | .193 | 1.304 | .195 |
| Interpersonal | -.010 | .022 | -.062 | -.439 | .661 |

The regression analysis showed that quality was significantly affected by the strategy agility, management and team work parameters of the strategic success. The regression model was significant as $F = 27.6$, $p < 0.05$. The model develop explains the 55.0% of the information about the dependent variable.

Table 11: Regression Analysis of the Reliability as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | T | Sig. |
|------------------|------------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | .511 | .234 | | 2.179 | .031 |
| Strategy Agility | .008 | .028 | .029 | .294 | .769 |
| Management | -.016 | .025 | -.085 | -.659 | .511 |
| Team Work | .145 | .030 | .841 | 4.809 | .000 |
| Administration | -.075 | .048 | -.201 | -1.563 | .121 |
| Interpersonal | .044 | .024 | .224 | 1.835 | .069 |

The regression analysis showed that reliability was significantly affected by the *team work* parameters of the strategic success. The regression model was significant as $F = 44.1$, $p < 0.05$. The model develop explains the 66.0% of the information about the dependent variable.

Table 12: Regression Analysis of the Productivity as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | T | Sig. |
|------------------|------------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | .172 | .320 | | .536 | .593 |
| Strategy Agility | .090 | .038 | .313 | 2.396 | .018 |
| Management | .018 | .034 | .089 | .530 | .597 |
| Team Work | .045 | .041 | .253 | 1.101 | .273 |
| Administration | .097 | .066 | .249 | 1.478 | .142 |
| Interpersonal | -.049 | .033 | -.241 | -1.508 | .134 |

The regression analysis showed that productivity was significantly affected by the strategy agility parameters of the strategic success. The regression model was significant as $F = 16.3$, $p < 0.05$. The model develop explains the 42.0% of the information about the dependent variable.

Table 13: Regression Analysis of the Growth and Expansion as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | T | Sig. |
|------------------|------------------------------|------------|---------------------------|-------|------|
| | B | Std. Error | Beta | | |
| (Constant) | .232 | .296 | | .785 | .434 |
| Strategy Agility | .083 | .035 | .316 | 2.381 | .019 |
| Management | .079 | .031 | .433 | 2.523 | .013 |
| Team Work | .005 | .038 | .030 | .130 | .896 |
| Administration | -.026 | .061 | -.074 | -.429 | .669 |
| Interpersonal | -.011 | .030 | -.061 | -.375 | .709 |

The regression analysis showed that growth and expansion was significantly affected by the strategy agility and management parameters of the strategic success. The regression model was significant as $F = 15.0$, $p < 0.05$. The model develop explains the 40.0% of the information about the dependent variable.

Table 14: Regression Analysis of the Competitiveness as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | T | Sig. |
|------------------|------------------------------|------------|---------------------------|-------|------|
| | B | Std. Error | Beta | | |
| (Constant) | .502 | .248 | | 2.024 | .045 |
| Strategy Agility | -.007 | .029 | -.030 | -.248 | .804 |
| Management | .006 | .026 | .038 | .243 | .809 |
| Team Work | .102 | .032 | .680 | 3.191 | .002 |
| Administration | .023 | .051 | .071 | .454 | .651 |
| Interpersonal | -.009 | .025 | -.050 | -.337 | .737 |

The regression analysis showed that competitiveness was significantly affected by the team work parameters of the strategic success. The regression model was significant as $F = 22.4$, $p < 0.05$. The model develop explains the 50.0% of the information about the dependent variable.

Table 15: Regression Analysis of the Sales Annually as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | T | Sig. |
|------------------|------------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | .529 | .319 | | 1.661 | .100 |
| Strategy Agility | .077 | .038 | .288 | 2.056 | .042 |
| Management | .032 | .034 | .173 | .955 | .342 |
| Team Work | .033 | .041 | .198 | .805 | .423 |
| Administration | .058 | .065 | .159 | .881 | .380 |
| Interpersonal | -.044 | .032 | -.234 | -1.368 | .174 |

The regression analysis showed that sales annually were significantly affected by the strategy agility parameters of the strategic success. The regression model was significant as $F = 11.2$, $p < 0.05$. The model develop explains the 33.0% of the information about the dependent variable.

Table 16: Regression Analysis of the Profit Annually as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | T | Sig. |
|------------------|------------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | .158 | .327 | | .482 | .631 |
| Strategy Agility | .023 | .039 | .077 | .601 | .549 |
| Management | .130 | .035 | .615 | 3.735 | .000 |
| Team Work | .038 | .042 | .205 | .914 | .363 |
| Administration | .001 | .067 | .002 | .014 | .989 |
| Interpersonal | -.057 | .033 | -.270 | -1.728 | .087 |

The regression analysis showed that profit annually was significantly affected by the management parameters of the strategic success. The regression model was significant as $F = 18.1$, $p < 0.05$. The model develop explains the 44.0% of the information about the dependent variable.

Table 17: Regression Analysis of the Market Share as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | t | Sig. |
|------------------|------------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | 1.101 | .244 | | 4.503 | .000 |
| Strategy Agility | .039 | .029 | .196 | 1.369 | .174 |
| Management | .043 | .026 | .304 | 1.649 | .102 |
| Team Work | .013 | .031 | .103 | .411 | .682 |
| Administration | -.082 | .050 | -.300 | -1.628 | .106 |
| Interpersonal | .039 | .025 | .276 | 1.581 | .117 |

The regression analysis showed that market share was not significantly affected by the parameters of the strategic success. The regression model was significant as $F = 10.0$, $p < 0.05$. The model develop explains the 31.0% of the information about the dependent variable.

Table 18: Regression Analysis of the Customer Base as Dependent and Parameters of Strategic Success as Independent

| | Un standardized Coefficients | | Standardized Coefficients | T | Sig. |
|------------------|------------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | .686 | .289 | | 2.370 | .020 |
| Strategy Agility | .046 | .034 | .192 | 1.355 | .178 |
| Management | .071 | .031 | .421 | 2.307 | .023 |
| Team Work | -.076 | .037 | -.507 | -2.040 | .044 |
| Administration | .048 | .059 | .147 | .807 | .421 |
| Interpersonal | .061 | .029 | .359 | 2.075 | .040 |

The regression analysis showed that customer base was significantly affected by the management, team work and interpersonal parameters of the strategic success. The regression model was significant as $F = 10.6$, $p < 0.05$. The model developed explains the 32.0% of the information about the dependent variable.

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