

CHAPTER 7

RESEARCH RESULTS

Based on the research objectives and the literature review, four main research propositions and hypotheses are evaluated to answer the objectives of this study. The results of data analysis and hypotheses testing are presented as below.

7.1 The General Background of Respondents

According to questionnaire section 1, the demographic of respondents such as age, gender, education, working experiences, department, and task were included in the study providing a descriptive profile of the survey respondents. A general overview of the demographics of the respondents is as follows:

7.1.1 Gender

Survey respondents were simply asked their gender. The majority of the respondents were male, 60.5% and the rest 39.55% were female.

Table 7.1: Gender of the respondents

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	45	39.5	39.5	39.5
	Male	69	60.5	60.5	100.0
Total		114	100.0	100.0	

7.1.2 Age

Survey respondents were simply asked their age in an close-ended question. The majority of the respondents belonged to the 25-29 years old group (58.8%), followed by the 20-24 years old group (18.4%), the 30-34 years old group (18.4%), the 40 years old and over group (2.6%), and the 35-39 years old group (1.8%).

Table 7.2: Age of the respondents

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20 - 24 year	21	18.4	18.4	18.4
	25 - 29 year	67	58.8	58.8	77.2
	30 - 34 year	21	18.4	18.4	95.6
	35 - 39 year	2	1.8	1.8	97.4
	40 and over	3	2.6	2.6	100.0
	Total	114	100.0	100.0	

7.1.3 Education

Repondents were asked to provide information regarding the level of education they had completed. The majority of the repondents were had Master's degree (47.4%), followed by Bachelor's degree (45.6%), and Doctorate (7.0%).

Table 7.3: Education of the respondents

Educat

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor's	52	45.6	45.6	45.6
	Master's	54	47.4	47.4	93.0
	Doctoral	8	7.0	7.0	100.0
	Total	114	100.0	100.0	

7.1.4 Experience

Repondents were asked to provide information regarding their experience. The majority of the repondents were had experience lower than 1 year (50.9%), followed by 1-3 years (32.5%), 4-6 years (15.8%), and 10 years and over (0.9%).

Table 7.4: Experience of the respondents

Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lower 1 year	58	50.9	50.9	50.9
	1 - 3 year	37	32.5	32.5	83.3
	4 - 6 year	18	15.8	15.8	99.1
	10 year and over	1	.9	.9	100.0
	Total	114	100.0	100.0	

7.1.5 Department

Repondents were asked to provide information regarding their department. The majority of the repondents are from Process Engineering Department (72.8%), followed by Quality Assurance (14.9%), Manufacturing (7.9%), and Tooling design (4.4%).

Table 7.5: Department of the respondents

		Department			
		Frequency	Percent	Valid Percent	Cumulativ e Percent
Valid	Mfg	9	7.9	7.9	7.9
	Process Eng	83	72.8	72.8	80.7
	Quality Eng	17	14.9	14.9	95.6
	Tooling Design	5	4.4	4.4	100.0
	Total	114	100.0	100.0	

7.1.6 Project Type

Repondents were asked to provide information regarding their project type. The majority of the repondents are working in Optical Active Component Project (33.3%), followed by Optical Passive Component Project (32.5%), Data Communication (21.1%), Optical Amplifier (8.8%), and Automotive (4.4%).

Table 7.6: Project type of the respondents

		Project type			
		Frequency	Percent	Valid Percent	Cumulativ e Percent
Valid	Passive component/optical	37	32.5	32.5	32.5
	Active component/optical	38	33.3	33.3	65.8
	Optical amplifiers	10	8.8	8.8	74.6
	Data communication	24	21.1	21.1	95.6
	Automotive	5	4.4	4.4	100.0
	Total	114	100.0	100.0	

7.1.7 Project in Experience

Repondents were asked to provide information regarding their new product introduction project in experience. The majority of the repondents have been

working for 1-2 project in experience (72.8%), followed by 3-4 projects (17.5%), 7 projects and more (8.8%), and 5-6 project (2.6%).

Table 7.7: Project in experience of the respondents

		Project in experience			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 - 2 projects	81	71.1	71.1	71.1
	3 - 4 projects	20	17.5	17.5	88.6
	5 - 6 projects	3	2.6	2.6	91.2
	7 projects and more	10	8.8	8.8	100.0
	Total	114	100.0	100.0	

7.1.8 People in Team

Repondents were asked to provide information regarding their people getting involve in new product introduction project. The majority of the repondents having people in team 4-6 people (31.6%), and 7-9 people (31.6%), followed by 13 people and more (15.8%), 10-12 people (12.3%), and 1-3 people (8.8%).

Table 7.8: People in team of the respondents

		People in team			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 - 3 people	10	8.8	8.8	8.8
	4 - 6 people	36	31.6	31.6	40.4
	7 - 9 people	36	31.6	31.6	71.9
	10 - 12 people	14	12.3	12.3	84.2
	13 people and more	18	15.8	15.8	100.0
	Total	114	100.0	100.0	

7.1.9 Project take time

Repondents were asked to provide information regarding their new product introduction project take time. The majority of the repondents answered that their project take time is around 4-6 months (33.3%), followed by 7-9 months (25.4%), 13 months (22.8%), over 1 year (10.5%), and 10-12 months (7.9%).

Table 7.9: Project take time of the respondents

Project take time					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 - 3 months	26	22.8	22.8	22.8
	4 - 6 months	38	33.3	33.3	56.1
	7 - 9 months	29	25.4	25.4	81.6
	10 - 12 months	9	7.9	7.9	89.5
	over 1 year	12	10.5	10.5	100.0
	Total	114	100.0	100.0	

7.2 New Product Introduction Success Factor Evaluation

Based on the research objectives and the literature review, four main success factors which are Knowledge Integration, Problem Solving and Uncertainty Reduction, Continuous Concurrency, and Simplicity were selected to study.

In order to evaluate the factors that contribute to succession of new product introduction in the case company, questionnaires in section 4 were designed to study and evaluate the agreement level of the respondents in each factor.

To assess the agreement level from each factor, descriptive statistics was performed on all questions to obtain ranges, frequencies, and percentage.

7.2.1. Factor 1: Knowledge Integration

<p><u>Factor 1:</u> A company's ability to integrate and embed in shared knowledge, learning and communication and information evaluation.</p>

7.2.1.1. Sub-factor: X1

<p>X₁ : A team's ability to integrate and embed in shared knowledge and understanding of current <i>customers'</i> needs and future value to customer among product development members.</p>
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Respondents were asked to ranking their agreement on team's ability to integrate and embed in shared knowledge and understanding of current *customers'* needs and future value to customer among product development

members whether it can be contributed to succession of NPI project or not. Very high level of agreement to very low level of agreement will be scoring from 5 to 1.

Table 7.10: Agreement level of knowledge integration success factor, X_1

		Knowledge Success Factor1			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	10	8.8	8.8	8.8
	Undecided	43	37.7	37.7	46.5
	Agree	31	27.2	27.2	73.7
	Strongly agree	30	26.3	26.3	100.0
	Total	114	100.0	100.0	

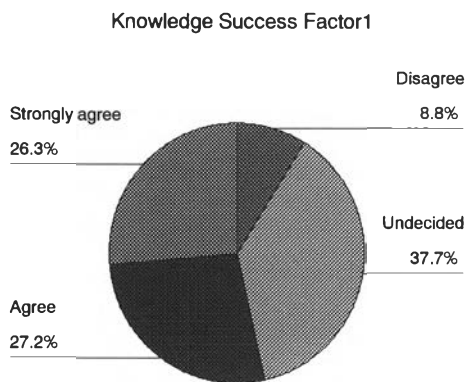


Figure 7.1: Agreement level of knowledge integration success factor, X_1

The results of the questionnaire showed that 27.2% of respondents are agree, 26.3% are strongly agree while only 8.8% are disagree and 37.7% are undecided.

Based on the result, it indicated that more than 53.5% of respondents have positive agreement on team's ability to integrate and embed in shared knowledge and understanding of current *customers'* needs and future value to customer among product development members can be contributed to succession of NPI project.

7.2.1.2. Sub-factor: X2

X₂ : A team's ability to integrate and embed in shared understanding of *suppliers'* design, process, and manufacturing capabilities among product development team members.

Respondents were asked to ranking their agreement on team's ability to integrate and embed in shared understanding of *suppliers'* design, process, and manufacturing capabilities among product development team members whether it can be contributed to succession of NPI project or not. Very high level of agreement to very low level of agreement will be scoring from 5 to 1.

Table 7.11: Agreement level of knowledge integration success factor, X₂

		Knowledge Success Factor2			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	18	15.8	15.8	15.8
	Undecided	46	40.4	40.4	56.1
	Agree	37	32.5	32.5	88.6
	Strongly agree	13	11.4	11.4	100.0
	Total	114	100.0	100.0	

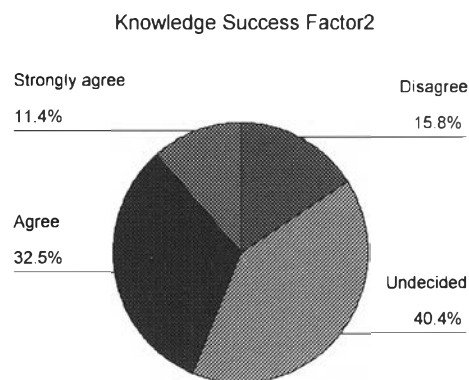


Figure 7.2: Agreement level of knowledge integration success factor, X₂

The results of the questionnaire showed that 32.5% of respondents are agree, 11.4% are strongly agree while only 15.8% are disagree and 40.4% are undecided.

Based on the result, it indicated that more than 43.9% of respondents have positive agreement on team's ability to integrate and embed in shared understanding of *suppliers'* design, process, and manufacturing capabilities among product development team members can be contributed to succession of NPI project.

7.2.1.3. Sub-factor: X3

X₃ : A team's ability to integrate and embed in shared understanding of the firm's internal design, process and manufacturing capabilities among product development members.

Respondents were asked to ranking their agreement on team's ability to integrate and embed in shared understanding of *suppliers'* design, process, and manufacturing capabilities among product development team members whether it can be contributed to succession of NPI project or not. Very high level of agreement to very low level of agreement will be scoring from 5 to 1.

Table 7.12: Agreement level of knowledge integration success factor, X₃

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	12	10.5	10.5	10.5
	Undecided	38	33.3	33.3	43.9
	Agree	51	44.7	44.7	88.6
	Strongly agree	13	11.4	11.4	100.0
	Total	114	100.0	100.0	

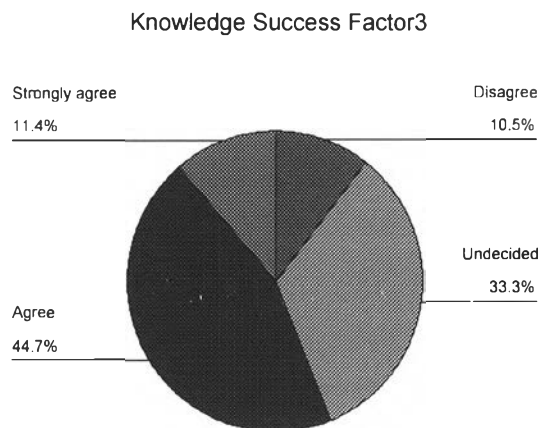


Figure 7.3: Agreement level of knowledge integration success factor, X₃

The results of the questionnaire showed that 44.7% of respondents are agree, 11.4% are strongly agree while only 10.5% are disagree and 33.3% are undecided.

Based on the result, it indicated that more than 56.1% of respondents have positive agreement on contribution of team's ability to integrate and embed in shared understanding of the firm's internal design, process and manufacturing capabilities among product development members as it can be contributed to succession of NPI project.

7.2.1.4. Sub-factor: X4

X₄ : A team's ability to integrate and embed in sustain significant improvements in development over long periods of time rests on the capability to learn from experience.

Respondents were asked to ranking their agreement on team's ability to integrate and embed in sustain significant improvements in development over long periods of time rests on the capability to learn from experience whether it can be contributed to succession of NPI project or not. Very high level of agreement to very low level of agreement will be scoring from 5 to 1.

Table 7.13: Agreement level of knowledge integration success factor, X₄

		Knowledge Success Factor4			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	16	14.0	14.0	14.0
	Undecided	40	35.1	35.1	49.1
	Agree	45	39.5	39.5	88.6
	Strongly agree	13	11.4	11.4	100.0
Total		114	100.0	100.0	

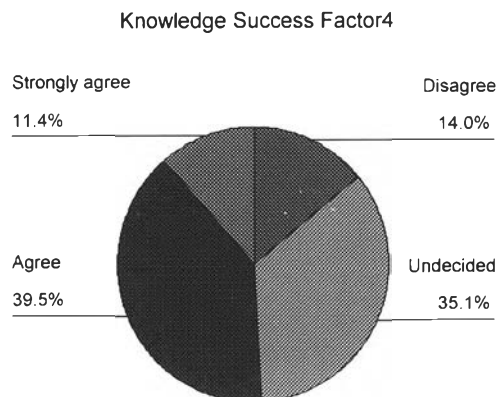


Figure 7.4: Agreement level of knowledge integration success factor, X₄

The results of the questionnaire showed that 39.5% of respondents are agree, 11.4% are strongly agree while only 14.0% are disagree and 35.1% are undecided.

Based on the result, it indicated that more than 49.1% of respondents have positive agreement on contribution of team's ability to integrate and embed in sustain significant improvements in development over long periods of time rests on the capability to learn from experience as it can be contributed to succession of NPI project.

7.2.1.5. Sub-factor: X₅

X₅ : A team's ability to has effectively use of communication and information flow between the team.

Respondents were asked to ranking their agreement on team's ability to has effectively use of communication and information flow between the team whether it can be contributed to succession of NPI project or not. Very high level of agreement to very low level of agreement will be scoring from 5 to 1.

Table 7.14: Agreement level of knowledge integration success factor, X₅

Knowledge Success Factor5

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Disagree	12	10.5	10.5	10.5
Undecided	36	31.6	31.6	42.1
Agree	51	44.7	44.7	86.8
Strongly agree	15	13.2	13.2	100.0
Total	114	100.0	100.0	

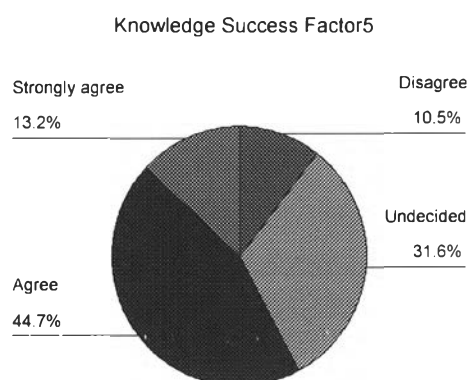


Figure 7.5: Agreement level of knowledge integration success factor, X₅

The results of the questionnaire showed that 44.7% of respondents are agree, 13.2% are strongly agree while only 10.5% are disagree and 31.6% are undecided.

Based on the result, it indicated that more than 57.9% of respondents have positive agreement on contribution of team's ability to has effectively use of communication and information flow between the team as it can be contributed to succession of NPI project.

7.2.1.6 Factor 1: Knowledge Integration Evaluation Results

To evaluate agreement level of respondents in contribution of Knowledge Integration, average results from question 1 – 5 of each respondent will be calculated and statistically evaluated the agreement level by using the following concepts;

$$\text{Agreement Interval} = (\text{maximum value} - \text{minimum value}) / \text{total agreement level}$$

From above concepts, the team agreement levels are as below;

$$\text{Interval} = (5 - 1) / 5 = 0.8$$

Very High	4.21	to	5.00
High	3.41	to	4.20
Middle	2.61	to	3.40
Low	1.81	to	2.60
Very Low	1.00	to	1.80

Based on the above agreement levels, average result of all respondents were re-scored and summarized as below table.

Table 7.15: Agreement evaluation of knowledge integration success factors

Success Factor for Knowledge Integration_Sum Q1-Q5					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low level	10	8.8	8.8	8.8
	Moderate level	49	43.0	43.0	51.8
	High level	36	31.6	31.6	83.3
	Very high level	19	16.7	16.7	100.0
	Total	114	100.0	100.0	

Success Factor for Knowledge Integration_Sum Q1-Q5

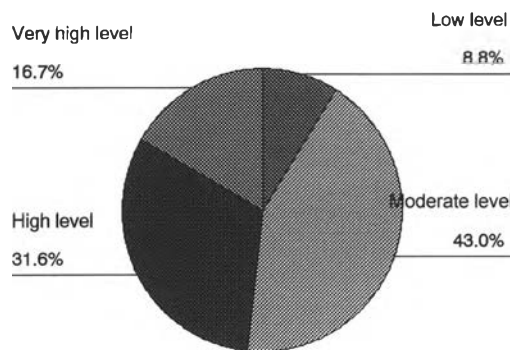


Figure 7.6: Agreement evaluation of knowledge integration success factors

The results of the evaluation showed that agreement of respondents are 43.0% at moderate level, 31.6% at high level, and 16.7% at very high level while 8.8% are at low level and 0% at very low level.

Based on the result, it indicated that more than 59.7% of respondents have positive agreement on contribution of team's ability to integrate and embed in shared knowledge, learning and communication and information evaluation as it can be contributed to succession of NPI project.

7.2.2 Factor 2: Problem Solving and Uncertainty Reduction

Factor 2: A company's ability to identify and solve problems early and the ability to avoid and reduce uncertainty already in the early phases by applying quality management practices such as lean, TQM, and continuous improvement principles.

7.2.2.1. Sub-factor: X1

X₁ : A team's ability to identify and solve problems in the early phases is essential to succession of the NPI project.

Respondents were asked to ranking their agreement on team's ability to identify and solve problems in the early phases whether it can be contributed to succession of NPI project or not. Very high level of agreement to very low level of agreement will be scoring from 5 to 1.

Table 7.16: Agreement level of problem solving and uncertainty reduction success factor, X₁

		Problem Solv Success Factor1			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	1.8	1.8	1.8
	Disagree	2	1.8	1.8	3.5
	Undecided	42	36.8	36.8	40.4
	Agree	47	41.2	41.2	81.6
	Strongly agree	21	18.4	18.4	100.0
Total		114	100.0	100.0	

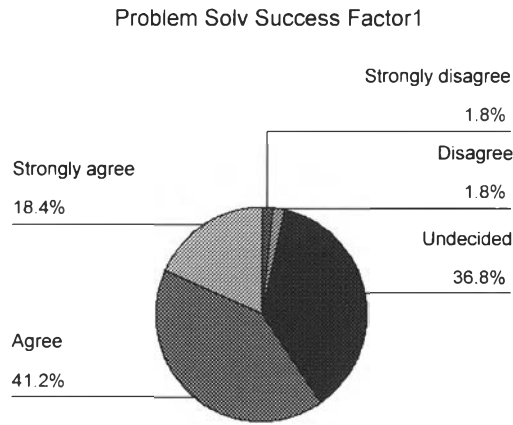


Figure 7.7: Agreement level of problem solving and uncertainty reduction success factor, X_1

The results of the questionnaire showed that 41.2% of respondents are agree, 18.4% are strongly agree while only 1.8% are strongly disagree, 1.8% are disagree, and 36.8% are undecided.

Based on the result, it indicated that more than 59.6% of respondents have positive agreement on contribution of team's ability to integrate and embed in shared knowledge, learning and communication and information evaluation as it can be contributed to succession of NPI project.

7.2.2.2. Sub-factor: X2

X_2 : A team's ability to avoid and reduce uncertainty already in the early phases is essential to succession of the NPI project.

Respondents were asked to ranking their agreement on team's ability to avoid and reduce uncertainty already in the early phases whether it can be contributed to succession of NPI project or not. Very high level of agreement to very low level of agreement will be scoring from 5 to 1.

Table 7.17: Agreement level of problem solving and uncertainty reduction success factor, X_2

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Disagree	18	15.8	15.8	15.8
Undecided	40	35.1	35.1	50.9
Agree	45	39.5	39.5	90.4
Strongly agree	11	9.6	9.6	100.0
Total	114	100.0	100.0	

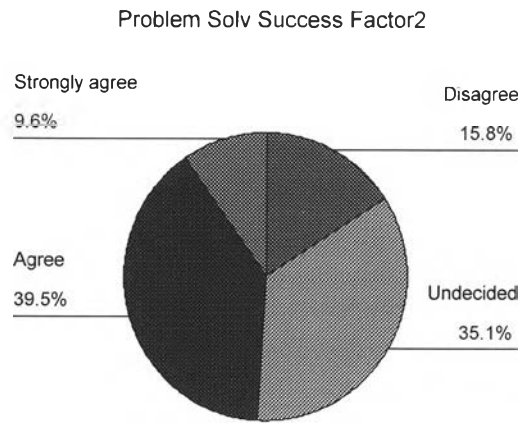


Figure 7.8: Agreement level of problem solving and uncertainty reduction success factor, X_2

The results of the questionnaire showed that 39.5% of respondents are agree, 9.6% are strongly agree while only 15.8% are disagree and 35.1% are undecided.

Based on the result, it indicated that more than 49.1% of respondents have positive agreement on contribution of team's ability to avoid and reduce uncertainty already in the early phases as it can be contributed to succession of NPI project.

7.2.2.3. Sub-factor: X_3

X_3 : Applying quality management practices such as lean, TQM, and continuous improvement principles will lead to succession of the NPI project.

Respondents were asked to ranking their agreement on applying quality management practices such as lean, TQM, and continuous improvement principles whether it can be contributed to succession of NPI project or not. Very high level of agreement to very low level of agreement will be scoring from 5 to 1.

Table 7.18: Agreement level of problem solving and uncertainty reduction success factor, X_3

Problem Solv Success Factor3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	28	24.6	24.6	24.6
	Undecided	42	36.8	36.8	61.4
	Agree	33	28.9	28.9	90.4
	Strongly agree	11	9.6	9.6	100.0
Total		114	100.0	100.0	

Problem Solv Success Factor3

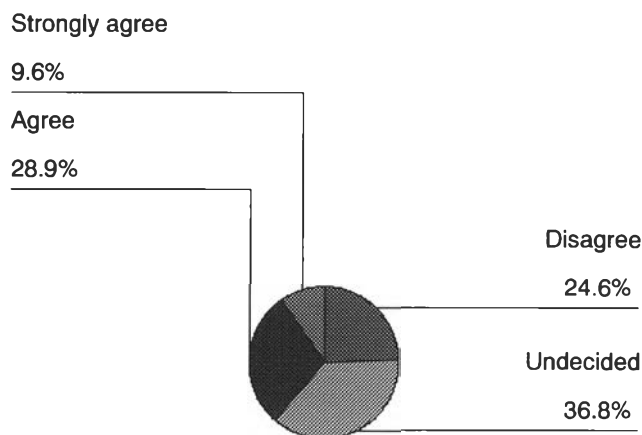


Figure 7.9: Agreement level of problem solving and uncertainty reduction success factor, X_3

The results of the questionnaire showed that 28.9% of respondents are agree, 9.6% are strongly agree while 24.6% are disagree and 36.8% are undecided.

Based on the result, it indicated that more than 38.5% of respondents have positive agreement on contribution of team's ability in applying quality management practices such as lean, TQM, and continuous improvement principles as it can be contributed to succession of NPI project.

7.2.2.4. Factor 2: Problem Solving and Uncertainty Reduction Evaluation Results

To evaluate agreement level of respondents in contribution of problem solving and uncertainty reduction, average results from question 6 – 8 of each respondent will be calculated and statistically evaluated the agreement level by using the following concepts;

Agreement Interval = (maximum value – minimum value) / total agreement level

From above concepts, the team agreement levels are as below;

$$\text{Interval} = (5 - 1) / 5 = 0.8$$

Very High	4.21	to	5.00
High	3.41	to	4.20
Middle	2.61	to	3.40
Low	1.81	to	2.60
Very Low	1.00	to	1.80

Table 7.19: Agreement evaluation of problem solving and uncertainty reduction success factors

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low level	12	10.5	10.5	10.5
	Moderate level	46	40.4	40.4	50.9
	High level	45	39.5	39.5	90.4
	Very high level	11	9.6	9.6	100.0
	Total	114	100.0	100.0	

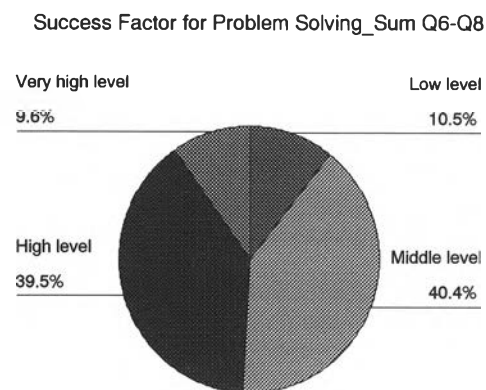


Figure 7.10: Agreement evaluation of problem solving and uncertainty reduction success factors

The results of the evaluation showed that agreement of respondents are 40.4% at moderate level, 39.5% at high level, and 9.6% at very high level while 10.5% are at low level and 0% at very low level.

Based on the result, it indicated that more than 49.1% of respondents have positive agreement on contribution of team's ability to identify and solve problems early and the ability to avoid and reduce uncertainty already in the early phases by applying quality management practices such as lean, TQM, and continuous improvement principles as it can be contributed to succession of NPI project.

7.2.3 Factor3: Continuous Concurrency

Factor 3: A company's ability to overlap tasks in the early phases and keep relevant people and functions continuously involved from the early to the late phases under the supportive from top management by the use of cross-functional or multidiscipline team, close relationship with customers and suppliers, top management commitment and visible support is essential to succession of NPI project.

7.2.3.1. Sub-factor: X1

X₁ : A team's ability to overlap tasks in the early phases is essential to succession of NPI project.

Respondents were asked to ranking their agreement on team's ability to overlap tasks in the early phases whether it can be contributed to succession of NPI project or not. Very high level of agreement to very low level of agreement will be scoring from 5 to 1.

Table 7.20: Agreement level of continuous concurrency success factor, X₁

Uncertainty Success Factor1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	16	14.0	14.0	14.0
	Undecided	48	42.1	42.1	56.1
	Agree	40	35.1	35.1	91.2
	Strongly agree	10	8.8	8.8	100.0
Total		114	100.0	100.0	

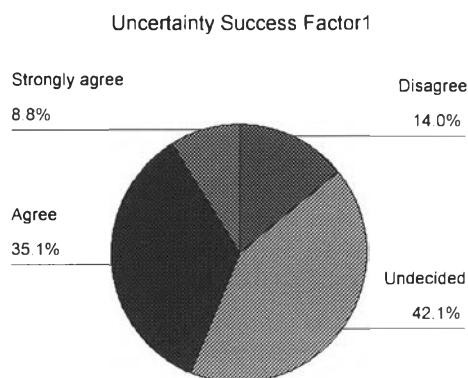


Figure 7.11: Agreement level of continuous concurrency success factor, X₁

The results of the questionnaire showed that 35.1% of respondents are agree, 8.8% are strongly agree while 14.0% are disagree and 42.1% are undecided. Based on the result, it indicated that more than 43.9% of respondents have positive agreement on contribution of team's ability to overlap tasks in the early phases as it can be contributed to succession of NPI project.

7.2.3.2. Sub-factor: X2

X₂ : A team's ability to keep relevant people and functions continuously involved from the early to the late phases by the use of cross-functional or multidiscipline team is essential to succession of NPI project.

Respondents were asked to ranking their agreement on team's ability to keep relevant people and functions continuously involved from the early to the late phases by the use of cross-functional or multidiscipline team whether it can be contributed to succession of NPI project or not. Very high level of agreement to very low level of agreement will be scoring from 5 to 1.

Table 7.21: Agreement level of continuous concurrency success factor, X₂

Uncertainty Success Factor2

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly disagree	2	1.8	1.8	1.8
Disagree	10	8.8	8.8	10.5
Undecided	48	42.1	42.1	52.6
Agree	41	36.0	36.0	88.6
Strongly agree	13	11.4	11.4	100.0
Total	114	100.0	100.0	

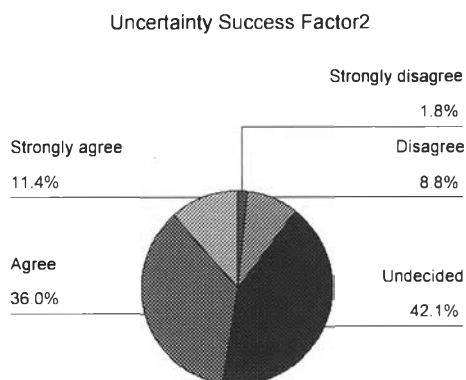


Figure 7.12: Agreement level of continuous concurrency success factor, X₂

The results of the questionnaire showed that 36.0% of respondents are agree, 11.4% are strongly agree while 1.8% are strongly disagree, 8.8% are disagree, and 35.1% are undecided.

Based on the result, it indicated that more than 47.4% of respondents have positive agreement on contribution of team's ability to keep relevant people and functions continuously involved from the early to the late phases by the use of cross-functional or multidiscipline team as it can be contributed to succession of NPI project.

7.2.3.3. Sub-factor: X3

X₃ : Supportive from top management or team champion/ leader is essential to succession of NPI project.

Respondents were asked to ranking their agreement on supportive from top management or team champion/ leader whether it can be contributed to succession of NPI project or not. Very high level of agreement to very low level of agreement will be scoring from 5 to 1.

Table 7.22: Agreement level of continuous concurrency success factor, X₃

Uncertainty Success Factor3

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly disagree	4	3.5	3.5	3.5
Disagree	14	12.3	12.3	15.8
Undecided	34	29.8	29.8	45.6
Agree	32	28.1	28.1	73.7
Strongly agree	30	26.3	26.3	100.0
Total	114	100.0	100.0	

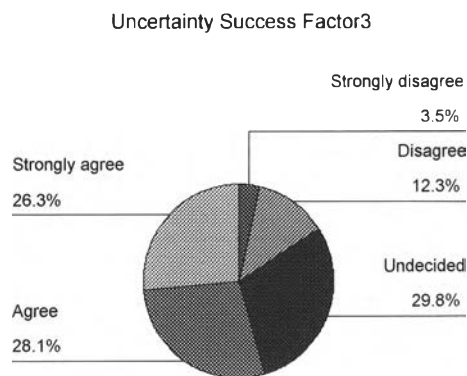


Figure 7.13: Agreement level of continuous concurrency success factor, X₃

The results of the questionnaire showed that 28.1% of respondents are agree, 26.3% are strongly agree while 3.5% are strongly disagree, 12.3% are disagree, and 29.8% are undecided.

Based on the result, it indicated that more than 54.4% of respondents have positive agreement on contribution of supportive from top management or team champion/ leader as it can be contributed to succession of NPI project.

7.2.3.4. Factor 3: Continuous Concurrency Evaluation Results

To evaluate agreement level of respondents in contribution of continuous concurrency, average results from question 9 – 11 of each respondent will be calculated and statistically evaluated the agreement level by using the following concepts;

Agreement Interval = (maximum value – minimum value) / total agreement level

From above concepts, the team agreement levels are as below;

$$\text{Interval} = (5 - 1) / 5 = 0.8$$

Very High	4.21	to	5.00
High	3.41	to	4.20
Middle	2.61	to	3.40
Low	1.81	to	2.60
Very Low	1.00	to	1.80

Table 7.23: Agreement evaluation of continuous concurrency success factors

Success Factor for Continuous Concurrent_Sum Q9-Q11					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low level	14	12.3	12.3	12.3
	Moderate level	43	37.7	37.7	50.0
	High level	31	27.2	27.2	77.2
	Very high level	26	22.8	22.8	100.0
	Total	114	100.0	100.0	

Success Factor for Continuous Concurrent_Sum Q9-Q1

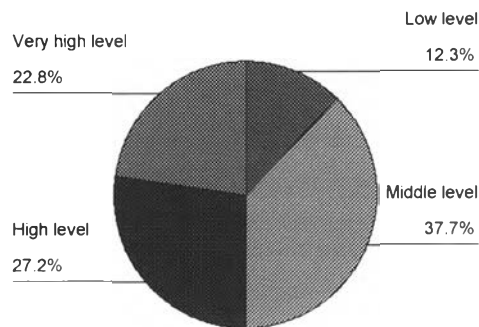


Figure 7.14: Agreement evaluation of continuous concurrency success factors

The results of the evaluation showed that agreement of respondents are 37.7% at moderate level, 27.2% at high level, and 22.8% at very high level while 12.3% are at low level and 0% at very low level.

Based on the result, it indicated that more than 50% of respondents have positive agreement on contribution of team's ability to overlap tasks in the early phases and keep relevant people and functions continuously involved from the early to the late phases under the supportive from top management by the use of cross-functional or multidiscipline team, close relationship with customers and suppliers, top management commitment and visible support as it can be contributed to succession of NPI project.

7.2.4 Factor 4: Simplicity

Factor 4: A company's ability to *reduce complexity* in products, processes, systems, documentation, and organization by applying the standardize tools and practices have significant positive effect on successful New Product Introduction.

7.2.4.1 Sub Factor: X1

X₁ : A team's ability to reduce complexity in products, processes, systems, documentation, and organization by reducing the overall development task and making the individual tasks simpler is essential to succession of NPI project.

Respondents were asked to ranking their agreement on team's ability to reduce complexity in products, processes, systems, documentation, and organization by

reducing the overall development task and making the individual tasks simpler whether it can be contributed to succession of NPI project or not. Very high level of agreement to very low level of agreement will be scoring from 5 to 1.

Table 7.24: Agreement level of simplicity success factor, X_1

		Simplicity Success Factor1			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	16	14.0	14.0	14.0
	Undecided	38	33.3	33.3	47.4
	Agree	37	32.5	32.5	79.8
	Strongly agree	23	20.2	20.2	100.0
	Total	114	100.0	100.0	

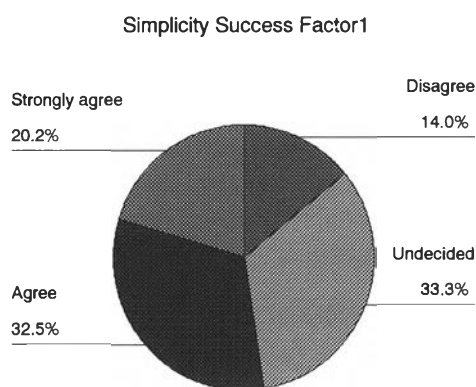


Figure 7.15: Agreement level of simplicity success factor, X_1

The results of the questionnaire showed that 32.5% of respondents are agree, 20.2% are strongly agree while 14% are disagree and 33.3% are undecided.

Based on the result, it indicated that more than 52.7% of respondents have positive agreement on contribution of team's ability to reduce complexity in products, processes, systems, documentation, and organization by reducing the overall development task and making the individual tasks simpler as it can be contributed to succession of NPI project.

7.2.4.2. Sub-factor: X2

X₂ : Applying the standard tools and practices such as Design for Manufacturability, Design of Experiments, Computer-based tools, Prototype, etc.

Respondents were asked to ranking their agreement on team's ability in applying the standard tools and practices such as Design for Manufacturability, Design of Experiments, Computer-based tools, Prototype, etc. whether it can be contributed to succession of NPI project or not. Very high level of agreement to very low level of agreement will be scoring from 5 to 1.

Table 7.25: Agreement level of simplicity success factor, X₂

		Simplicity Success Factor2			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	4	3.5	3.5	3.5
	Disagree	6	5.3	5.3	8.8
	Undecided	36	31.6	31.6	40.4
	Agree	49	43.0	43.0	83.3
	Strongly agree	19	16.7	16.7	100.0
	Total		114	100.0	100.0

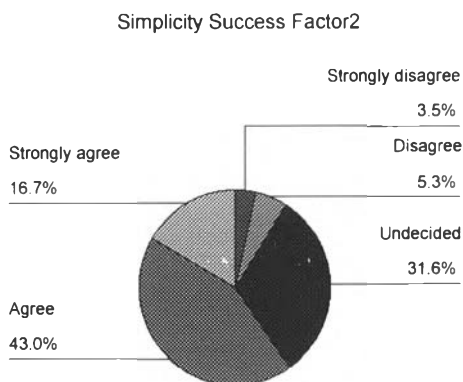


Figure 7.16: Agreement level of simplicity success factor, X₂

The results of the questionnaire showed that 43.0% of respondents are agree, 16.7% are strongly agree while 3.5% are strongly disagree, 5.3% are disagree, and 31.6% are undecided.

Based on the result, it indicated that more than 59.7% of respondents have positive agreement on contribution of team's ability in applying the standard tools and practices such as Design for Manufacturability, Design of Experiments, Computer-based tools, Prototype, etc as it can be contributed to succession of NPI project.

7.2.4.3 Factor 4: Simplicity Evaluation Results

To evaluate agreement level of respondents in contribution of simplicity, average results from question 12 – 13 of each respondent will be calculated and statistically evaluated the agreement level by using the following concepts;

Agreement Interval = (maximum value – minimum value) / total agreement level

From above concepts, the team agreement levels are as below;

Interval = (5 – 1) / 5 = 0.8

Very High	4.21	to	5.00
High	3.41	to	4.20
Middle	2.61	to	3.40
Low	1.81	to	2.60
Very Low	1.00	to	1.80

Table 7.26: Agreement evaluation of simplicity success factors

Success Factor for Simplicity_Sum Q12-Q13

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very low level	3	2.6	2.6	2.6
Low level	8	7.0	7.0	9.6
Moderate level	25	21.9	21.9	31.6
High level	55	48.2	48.2	79.8
Very high level	23	20.2	20.2	100.0
Total	114	100.0	100.0	

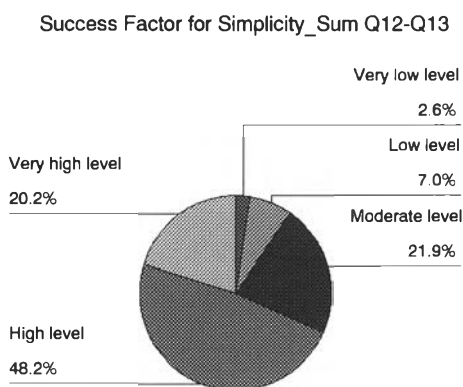


Figure 7.17: Agreement evaluation of simplicity success factors

The results of the evaluation showed that agreement of respondents are 21.9% at moderate level, 48.2% at high level, and 20.2% at very high level while 7.0% are at low level and 2.6% at very low level.

Based on the result, it indicated that more than **68.4%** of respondents have positive agreement on contribution of team's ability to *reduce complexity* in products, processes, systems, documentation, and organization by applying the standardize tools and practices as it can be contributed to succession of NPI project.

7.2.5 Evaluation Results of New Product Introduction Success Factors

To evaluate agreement level of respondents in contribution of the four main success factors, Knowledge Integration, Problem Solving and Uncertainty Reduction, Continuous Concurrency, and Simplicity, average results from question 1 – 13 of each respondent will be calculated and statistically evaluated the agreement level by using the following concepts;

Agreement Interval = (maximum value – minimum value) / total agreement level

From above concepts, the team agreement levels are as below;

$$\text{Interval} = (5 - 1) / 5 = 0.8$$

Very High	4.21	to	5.00
High	3.41	to	4.20
Middle	2.61	to	3.40
Low	1.81	to	2.60
Very Low	1.00	to	1.80

Table 7.27: Agreement evaluation of new product introduction success factors

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low level	6	5.3	5.3	5.3
Moderate level	46	40.4	40.4	45.6
High level	50	43.9	43.9	89.5
Very high level	12	10.5	10.5	100.0
Total	114	100.0	100.0	

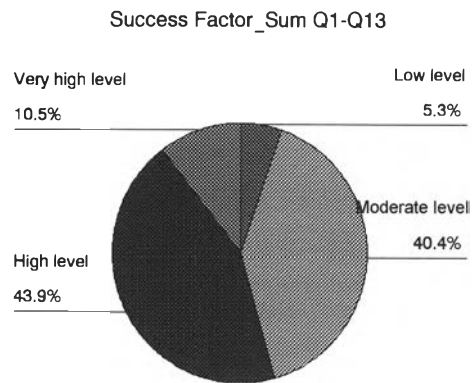


Figure 7.18: Agreement evaluation of new product introduction success factors

The results of the evaluation showed that agreement of respondents are 40.4% at moderate level, 43.9% at high level, and 10.5% at very high level while 5.3% are at low level.

Based on the result, it indicated that more than 54.4% of respondents have positive agreement on contribution of the following factors to succession of NPI project;

- Factor 1:** A company's ability to integrate and embed in shared knowledge, learning and communication and information evaluation.
- Factor 2:** A company's ability to identify and solve problems early and the ability to avoid and reduce uncertainty already in the early phases by applying quality management practices such as lean, TQM, and continuous improvement principles.
- Factor 3:** A company's ability to overlap tasks in the early phases and keep relevant people and functions continuously involved from the early to the late phases under the supportive from top management by the use of cross-functional or multidiscipline team, close relationship with customers and suppliers, top management commitment and visible support.
- Factor 4:** A company's ability to reduce complexity in products, processes, systems, documentation, and organization by applying the standardize tools and practices.

7.3 New Product Introduction Performance Evaluation

7.3.1 Knowledge Integration Performance Evaluation

Data from section 3, table 1, will be used to evaluate the new product introduction performance of the team’s in knowledge integration.

To check the knowledge integration performance of the team, average results from question 1 – 13 of each respondent will be calculated and will be statistically evaluated the performance level by using the following concepts;

$$\text{Performance Interval} = (\text{maximum value} - \text{minimum value}) / \text{total agreement level}$$

From above concepts, the team performance levels are as below;

$$\text{Interval} = (5 - 1) / 5 = 0.8$$

Very High	4.21	to	5.00
High	3.41	to	4.20
Middle	2.61	to	3.40
Low	1.81	to	2.60
Very Low	1.00	to	1.80

Table 7.28: Descriptive statistical results of knowledge integration performance evaluation

Statistics

Performance Evaluation for Knowledge Integration_Sum Q1-Q13

N	Valid	114
	Missing	0
Mean		3.33
Std. Deviation		.71
Minimum		2
Maximum		5
Sum		380

Table 7.29: Performance evaluation of knowledge integration

Performance Evaluation for Knowledge Integration_Sum Q1-Q13

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low level	14	12.3	12.3	12.3
Moderate level	50	43.9	43.9	56.1
High level	48	42.1	42.1	98.2
Very high level	2	1.8	1.8	100.0
Total	114	100.0	100.0	

formance Evaluation for Knowledge Integration_Sum Q1-

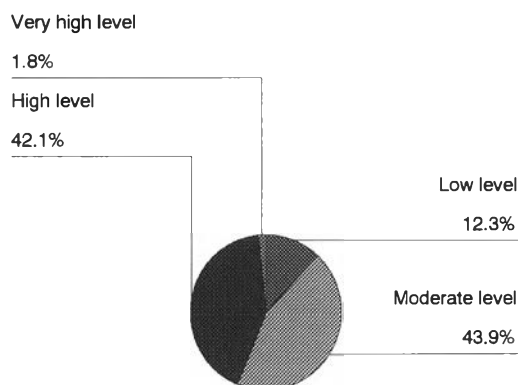


Figure 7.19: Performance evaluation of knowledge integration

The results of the evaluation showed that current performance of respondents are 43.9% at moderate level, 42.1% at high level, and 1.8% at very high level while 12.3% are at low level and 0% at very low level.

Based on the result, it indicated that there are **43.9%** of respondents have team's performance in knowledge integration higher than moderate level while there are **14.1%** of respondents have team's performance in knowledge integration lower than moderate level.

7.3.2 Problem solving and uncertainty reduction Performance Evaluation

Data from section 3, table 2, will be used to evaluate the new product introduction performance of the team's in problem solving and uncertainty reduction.

To check problem solving and uncertainty reduction performance of the team, average results from question 1 – 13 of each respondent will be calculated and statistically evaluated the performance level by using the following concepts;

Performance Interval = (maximum value – minimum value) / total agreement level

From above concepts, the team performance levels are as below;

$$\text{Interval} = (5 - 1) / 5 = 0.8$$

Very High	4.21	to	5.00
High	3.41	to	4.20
Middle	2.61	to	3.40
Low	1.81	to	2.60
Very Low	1.00	to	1.80

Table 7.30: Descriptive statistical results of problem solving and uncertainty reduction performance evaluation

Statistics

Performance Evaluation for Problem solving Sum Q1-Q13

N	Valid	114
	Missing	0
Mean		3.25
Std. Deviation		.63
Minimum		2
Maximum		5
Sum		370

Table 7.31: Performance evaluation of problem solving and uncertainty reduction

Performance Evaluation for Problem solving_Sum Q1-Q13

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low level	10	8.8	8.8	8.8
	Moderate level	68	59.6	59.6	68.4
	High level	34	29.8	29.8	98.2
	Very high level	2	1.8	1.8	100.0
	Total	114	100.0	100.0	

Performance Evaluation for Problem solving_Sum Q1-Q1

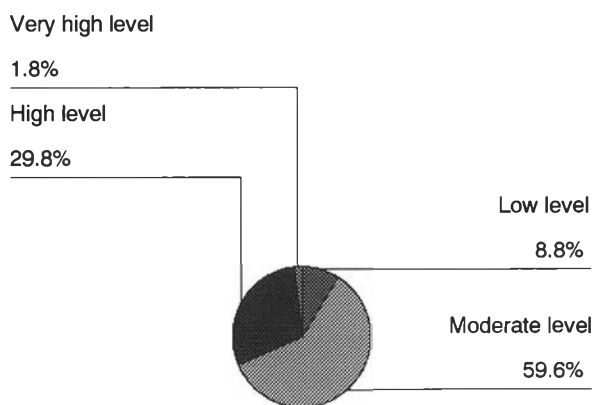


Figure 7.20: Performance evaluation of problem solving and uncertainty reduction

The results of the evaluation showed that current performance of respondents are 59.6% at moderate level, 29.8% at high level, and 1.8% at very high level while 8.8% are at low level and 0% at very low level.

Based on the result, it indicated that there are only **31.6%** of respondents have team's performance in problem solving and uncertainty reduction higher than moderate level while there are **10.6%** of respondents have team's performance in problem solving and uncertainty reduction lower than moderate level.

7.3.3 Continuous Concurrent Performance Evaluation

Data from section 3, table 3, will be used to evaluate the new product introduction performance of the team's in continuous concurrency.

To check continuous concurrency performance of the team, average results from question 1 – 13 of each respondent will be calculated and statistically evaluated the performance level by using the following concepts;

Performance Interval = (maximum value – minimum value) / total agreement level

From above concepts, the team performance levels are as below;

$$\text{Interval} = (5 - 1) / 5 = 0.8$$

Very High	4.21	to	5.00
High	3.41	to	4.20
Middle	2.61	to	3.40
Low	1.81	to	2.60
Very Low	1.00	to	1.80

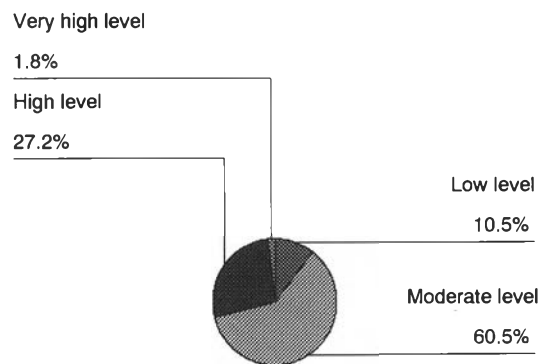
Table 7.32: Descriptive statistical results of continuous concurrency performance evaluation

Statistics		
Performance Evaluation for Continuous Concurrent Sum Q1-Q13		
N	Valid	114
	Missing	0
Mean		3.20
Std. Deviation		.64
Minimum		2
Maximum		5
Sum		365

Table 7.33: Performance evaluation of continuous concurrency

Performance Evaluation for Continuous Concurrent_Sum Q1-Q13					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low level	12	10.5	10.5	10.5
	Moderate level	69	60.5	60.5	71.1
	High level	31	27.2	27.2	98.2
	Very high level	2	1.8	1.8	100.0
	Total	114	100.0	100.0	

Performance Evaluation for Continuous Concurrent_Sum Q1

**Figure 7.21:** Performance evaluation of continuous concurrency

The results of the evaluation showed that current performance of respondents are 60.5% at moderate level, 27.2% at high level, and 1.8% at very high level while 10.5% are at low level and 0% at very low level.

Based on the result, it indicated that there are only **29.0%** of respondents have team's performance in continuous concurrent higher than moderate level and there are **10.5%** of respondents have team's performance in continuous concurrent lower than moderate level.

7.3.4 Simplicity Performance Evaluation

Data from section 3, table 4, will be used to evaluate the new product introduction performance of the team's in simplicity.

To check simplicity performance of the team, average results from question 1 – 13 of each respondent will be calculated and statistically evaluated the performance level by using the following concepts;

Performance Interval = (maximum value – minimum value) / total agreement level

From above concepts, the team performance levels are as below;

$$\text{Interval} = (5 - 1) / 5 = 0.8$$

Very High	4.21	to	5.00
High	3.41	to	4.20
Middle	2.61	to	3.40
Low	1.81	to	2.60
Very Low	1.00	to	1.80

Table 7.34: Descriptive statistical results of simplicity performance evaluation

Statistics

Performance Evaluation for Simplicity_Sum Q1-Q13

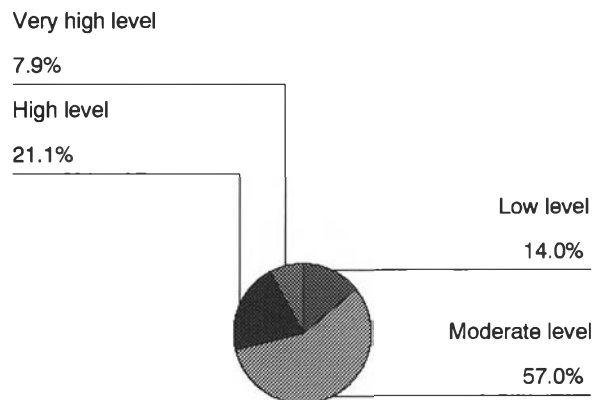
N	Valid	114
	Missing	0
Mean		3.23
Std. Deviation		.79
Minimum		2
Maximum		5
Sum		368

Table 7.35: Performance evaluation of simplicity

Performance Evaluation for Simplicity_Sum Q1-Q13

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low level	16	14.0	14.0	14.0
	Moderate level	65	57.0	57.0	71.1
	High level	24	21.1	21.1	92.1
	Very high level	9	7.9	7.9	100.0
	Total	114	100.0	100.0	

Performance Evaluation for Simplicity_Sum Q1-Q13

**Figure 7.22:** Performance evaluation of simplicity

The results of the evaluation showed that current performance of respondents are 57.0% at moderate level, 21.1% at high level, and 7.9% at very high level while 14.0% are at low level and 0% at very low level.

Based on the result, it indicated that there are only 29.0% of respondents have team's performance in simplicity higher than moderate level and there are 14.0% of respondents have team's performance in simplicity lower than moderate level.

7.4 Propositions and Hypotheses Testing

Based on the research objective and the literature review, four main research propositions and hypotheses are formulated to guide the objective number one of this study. To check the four propositions and hypotheses of the study, data from section 3 and section 4 will be statistically evaluated.

Results from questionnaire section 3, table 1 to table4, and section 4 were used to evaluate the effect of company capabilities in succession of new product introduction in the case company.

To check the proposition and hypotheses, results of team's performance in Knowledge Integration, Problem Solving and Uncertainty Reduction, Continuous Concurrency, and Simplicity will be statically evaluated against evaluation results of company success factors in order to verify their relationship by using Pearson Product Moment Correlation or Pearson's correlation.

7.4.1. Propositions and Hypotheses Testing for Research Question 1

According to research question 1, results from questionnaire section 3, table 1 to table4, were used to evaluate the effect of company capabilities (Knowledge Integration, Problem Solving and Uncertainty Reduction, Continuous Concurrency, and Simplicity) against succession of new product introduction in the case company.

Research Question 1: Do company's capabilities have significant affect and contribute to fast and effective new product introduction process; thus leading to a successful new product introduction process?

7.4.1.1. Propositions 1

Proposition 1: A company's ability to integrate and embed in shared knowledge, learning and communication and information evaluation have significant positive effect on successful New Product Introduction.

H₀ : A company's ability to integrate and embed in shared knowledge, learning and communication and information evaluation have no significant effect on successful New Product Introduction.

H₁ : A company's ability to integrate and embed in shared knowledge, learning and communication and information evaluation have significant positive effect on successful New Product Introduction.

To check the proposition and hypotheses, team's performance in ability to integrate and embed in shared knowledge, learning and communication and information evaluation will be statically evaluated against evaluation results of company success factors in order to verify their relationship by using Pearson Product Moment Correlation or Pearson's correlation.

Results from Table 6-1 shown that the correlation between team's performance in ability to integrate and embed in shared knowledge, learning and communication and information evaluation has *significant positive linear relationship* with company success factors at *Pearson's correlation 0.304*.

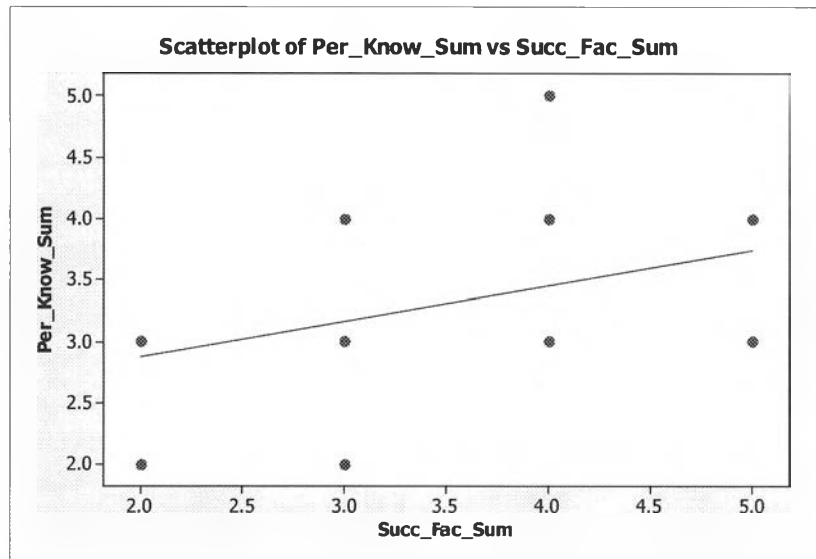


Figure 7.23: Scatterplot between company's performance in knowledge integration and new product introduction success factors

7.4.1.2. Propositions 2

Proposition 2: A company's ability to identify and solve problems early and the ability to avoid and reduce uncertainty already in the early phases by applying quality management practices such as lean, TQM, and continuous improvement principles have significant positive effect on successful New Product Introduction.

H₀ : A company's ability to identify and solve problems early and the ability to avoid and reduce uncertainty already in the early phases by applying quality management practices such as lean, TQM, and continuous improvement principles have significant positive effect on successful New Product Introduction.

H₁ : A company's ability to identify and solve problems early and the ability to avoid and reduce uncertainty already in the early phases by applying quality management practices such as lean, TQM, and continuous improvement principles have no significant effect on successful New Product Introduction.

To check the proposition and hypotheses, team's ability to identify and solve problems early and the ability to avoid and reduce uncertainty already in the early phases by applying quality management practices such as lean, TQM, and continuous improvement principles will be statically evaluated against evaluation results of company success factors in order to verify their relationship by using Pearson Product Moment Correlation or Pearson's correlation.

Results from Table 6-1 show that the correlation between team's ability to identify and solve problems early and the ability to avoid and reduce uncertainty already in the early phases by applying quality management practices such as lean, TQM, and continuous improvement principles has *significant positive linear relationship* with company success factors at *Pearson's correlation 0.379*.

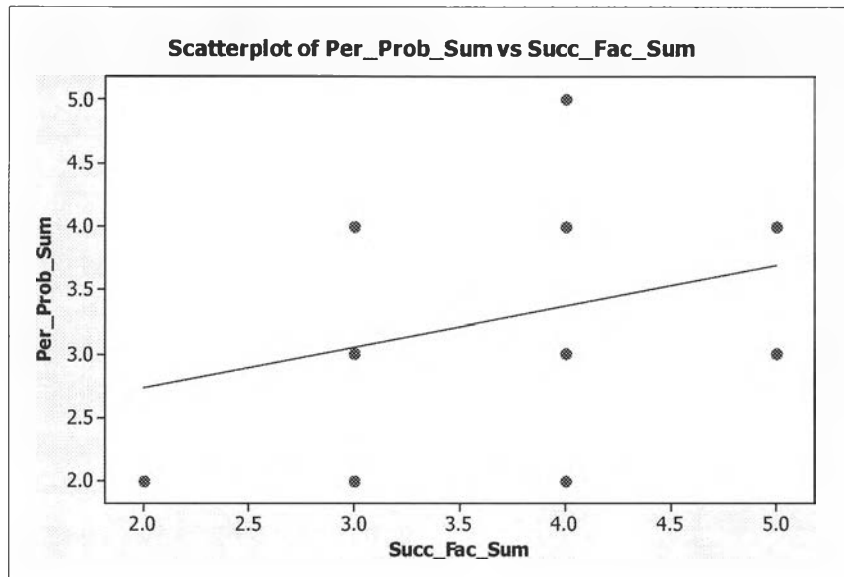


Figure 7.24: Scatterplot between company's performance in problem solving and uncertainty reduction and new product introduction success factors

7.4.1.3. Propositions 3

Proposition 3: A company's ability to overlap tasks in the early phases and keep relevant people and functions continuously involved from the early to the late phases under the supportive from top management by the use of cross-functional or multidiscipline team, close relationship with customers and suppliers, top management commitment and visible support have significant positive effect on successful New Product Introduction.

H₀ : A company's ability to overlap tasks in the early phases and keep relevant people and functions continuously involved from the early to the late phases under the supportive from top management by the use of cross-functional or multidiscipline team, close relationship with customers and suppliers, top management commitment and visible support have significant positive effect on successful New Product Introduction.

H₁ : A company's ability to overlap tasks in the early phases and keep relevant people and functions continuously involved from the early to the late phases under the supportive from top management by the use of cross-functional or multidiscipline team, close relationship with customers and suppliers, top management commitment and visible support have no significant effect on successful New Product Introduction.

To check the proposition and hypotheses, team's ability to overlap tasks in the early phases and keep relevant people and functions continuously involved from the early to the late phases under the supportive from top management by the use of cross-functional or multidiscipline team, close relationship with customers and suppliers, top management commitment and visible support will be statically evaluated against evaluation results of company success factors in order to verify their relationship by using Pearson Product Moment Correlation or Pearson's correlation.

Results from Table 6-1 shown that the correlation between team's ability to overlap tasks in the early phases and keep relevant people and functions continuously involved from the early to the late phases under the supportive from top management by the use of cross-functional or multidiscipline team, close relationship with customers and suppliers, top management commitment and visible support has *significant positive linear relationship* with company success factors at *Pearson's correlation 0.448*.

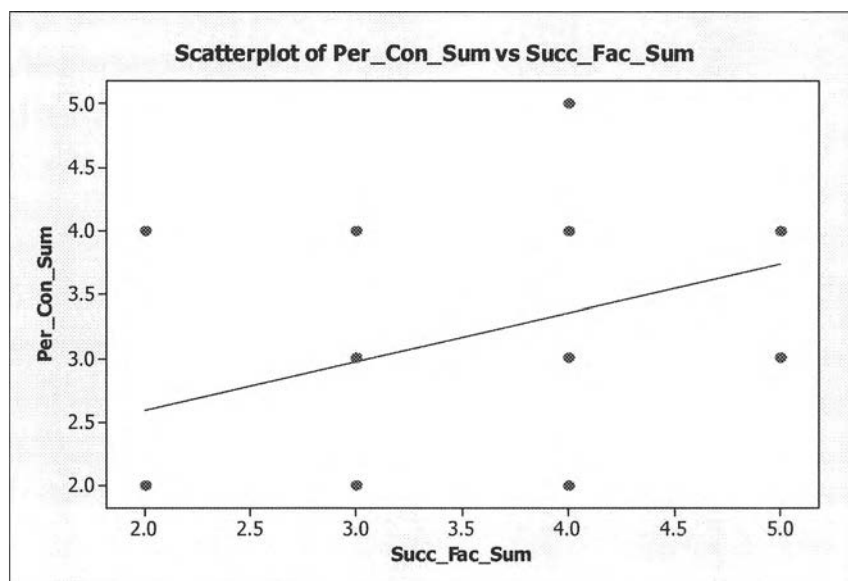


Figure 7.25: Scatterplot between company's performance in continuous concurrency and new product introduction success factors

7.4.1.4. Propositions 4

Proposition 4: A company's ability to reduce complexity in products, processes, systems, documentation, and organization by applying the standardize tools and practices have significant positive effect on successful New Product Introduction.

H₀: A company's ability to reduce complexity in products, processes, systems, documentation, and organization by applying the standardize tools and practices have significant positive effect on successful New Product Introduction.

H₁: A company's ability to reduce complexity in products, processes, systems, documentation, and organization by applying the standardize tools and practices have no significant effect on successful New Product Introduction.

To check the proposition and hypotheses, team's ability to reduce complexity in products, processes, systems, documentation, and organization by applying the standardize tools and practices will be statically evaluated against evaluation results of company success factors in order to verify their relationship by using Pearson Product Moment Correlation or Pearson's correlation.

Results from Table 6-1 shown that the correlation between team's ability to reduce complexity in products, processes, systems, documentation, and organization by applying the standardize tools and practices has *significant positive linear relationship* with company success factors at *Pearson's correlation 0.457*.

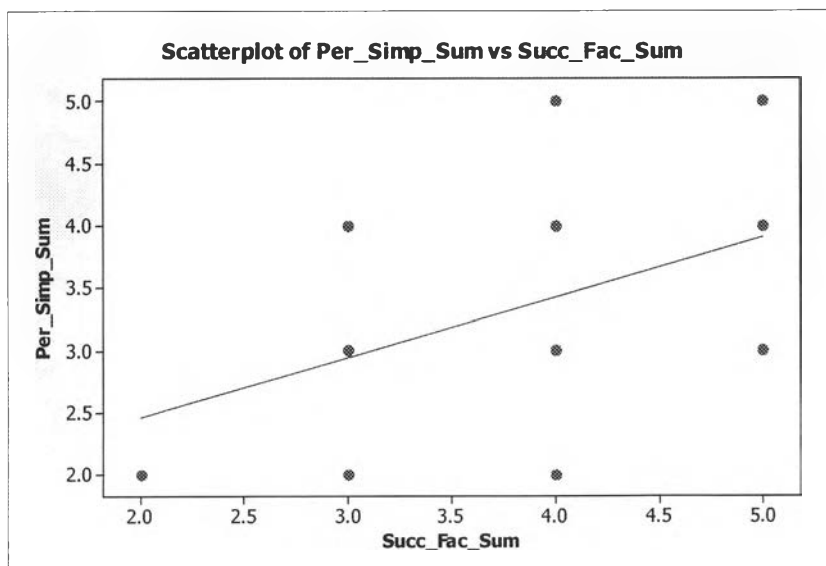


Figure 7.26: Scatterplot between company's performance in simplicity and new product introduction success factors

7.4.1.5. Correlation between each success factor

Results from table 7.36 shown that there are significant positive linear relationship between success factors as follows;

- There is a *significant positive linear relationship* between “company’s ability to integrate and embed in shared knowledge, learning and communication and information evaluation” and “company’s ability to identify and solve problems early and the ability to avoid and reduce uncertainty already in the early phases by applying quality management practices such as lean, TQM, and continuous improvement principles” at *Pearson’s correlation 0.505*.

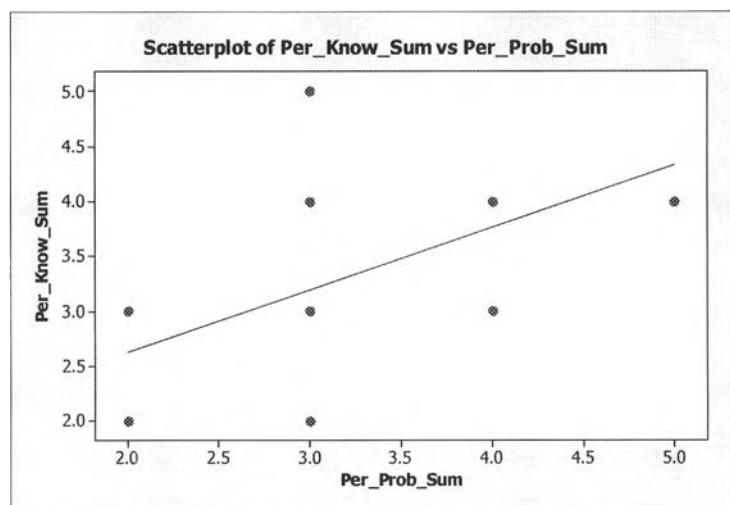


Figure 7.27: Scatterplot between company’s performance in knowledge integration and and problem solving and uncertainty reduction

- There is a *significant positive linear relationship* between “company’s ability to integrate and embed in shared knowledge, learning and communication and information evaluation” and “company’s ability to overlap tasks in the early phases and keep relevant people and functions continuously involved from the early to the late phases under the supportive from top management by the use of cross-functional or multidiscipline team, close relationship with customers and suppliers, top management commitment and visible support” at *Pearson’s correlation 0.453*.

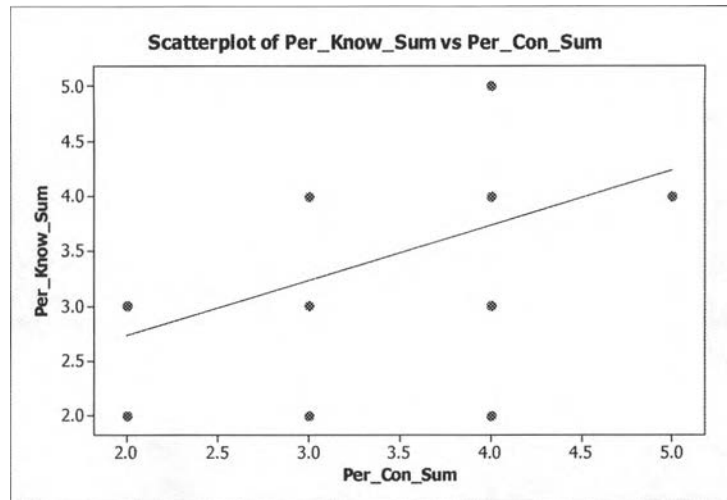


Figure 7.28: Scatterplot between company’s performance in knowledge integration and continuous concurrency

- There is a *significant positive linear relationship* between “company’s ability to integrate and embed in shared knowledge, learning and communication and information evaluation” and “company’s ability to reduce complexity in products, processes, systems, documentation, and organization by applying the standardize tools and practices” at *Pearson’s correlation 0.526*.

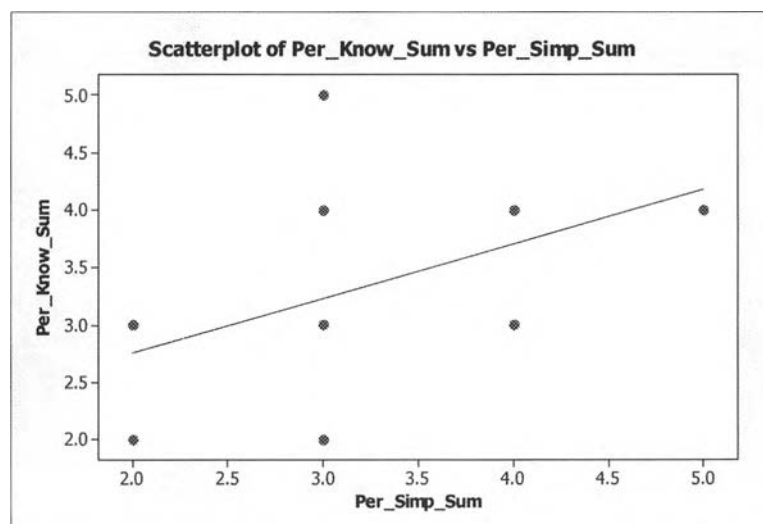


Figure 7.29: Scatterplot between company’s performance in knowledge integration and simplicity

- There is a *significant positive linear relationship* between “company’s ability to identify and solve problems early and the ability to avoid and reduce uncertainty already in the early phases by applying quality management practices such as lean, TQM, and continuous improvement principles” and “company’s ability to overlap tasks in the early phases and keep relevant people and functions continuously involved from the early to the late phases under the supportive from top

management by the use of cross-functional or multidiscipline team, close relationship with customers and suppliers, top management commitment and visible support” at *Pearson's correlation 0.554*.

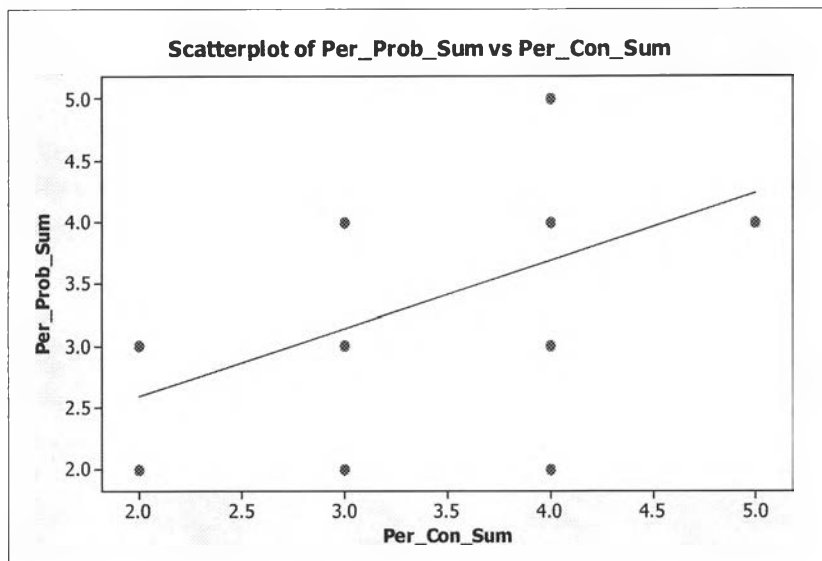


Figure 7.30: Scatterplot between company’s performance in problem solving and uncertainty reduction and continuous concurrency

- There is a *significant positive linear relationship* between “company's ability to identify and solve problems early and the ability to avoid and reduce uncertainty already in the early phases by applying quality management practices such as lean, TQM, and continuous improvement principles” and “company's ability to reduce complexity in products, processes, systems, documentation, and organization by applying the standardize tools and practices” at *Pearson's correlation 0.687*.

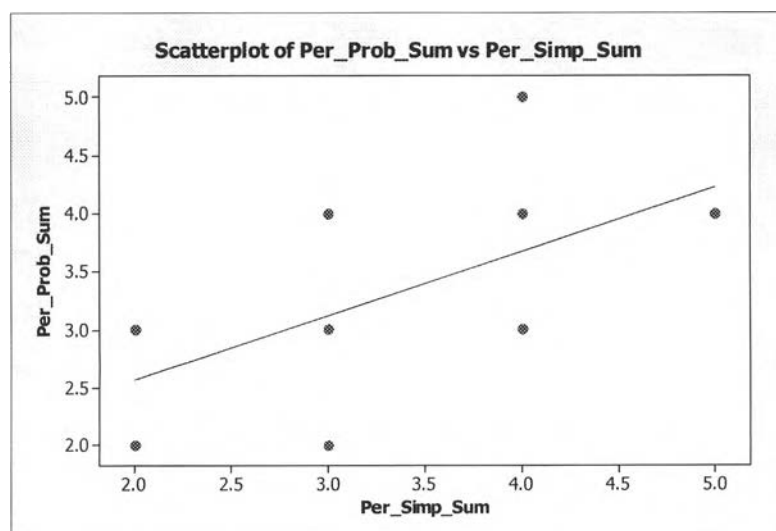


Figure 7.31: Scatterplot between company’s performance in problem solving and uncertainty reduction and simplicity

- There is a *significant positive linear relationship* between “company’s ability to overlap tasks in the early phases and keep relevant people and functions continuously involved from the early to the late phases under the supportive from top management by the use of cross-functional or multidiscipline team, close relationship with customers and suppliers, top management commitment and visible support” and “company's ability to reduce complexity in products, processes, systems, documentation, and organization by applying the standardize tools and practices” at *Pearson's correlation 0.610*.

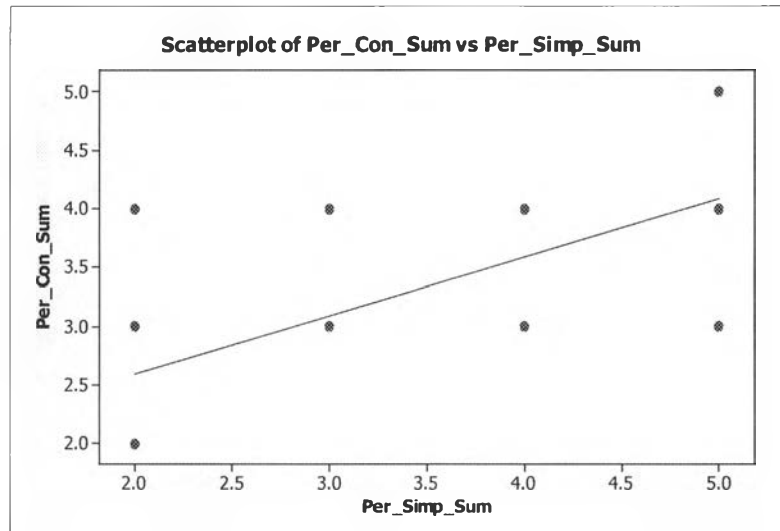


Figure 7.32: Scatterplot between company’s performance in continuous concurrency and simplicity

Table 7.36: Correlation results between each success factor**Correlations**

		Success Factor_Sum Q1-Q13	Performance Evaluation for Knowledge Integration_Sum Q1-Q13	Performance Evaluation for Problem solving_Sum Q1-Q13	Performance Evaluation for Continuous Concurrent_Sum Q1-Q13	Performance Evaluation for Simplicity_Sum Q1-Q13
Success Factor_Sum Q1-Q13	Pearson Correlation	1.000	.304**	.379**	.448**	.457**
	Sig. (2-tailed)	.	.001	.000	.000	.000
	N	114	114	114	114	114
Performance Evaluation for Knowledge Integration_Sum Q1-Q13	Pearson Correlation	.304**	1.000	.505**	.453**	.526**
	Sig. (2-tailed)	.001	.	.000	.000	.000
	N	114	114	114	114	114
Performance Evaluation for Problem solving_Sum Q1-Q13	Pearson Correlation	.379**	.505**	1.000	.554**	.687**
	Sig. (2-tailed)	.000	.000	.	.000	.000
	N	114	114	114	114	114
Performance Evaluation for Continuous Concurrent_Sum Q1-Q13	Pearson Correlation	.448**	.453**	.554**	1.000	.610**
	Sig. (2-tailed)	.000	.000	.000	.	.000
	N	114	114	114	114	114
Performance Evaluation for Simplicity_Sum Q1-Q13	Pearson Correlation	.457**	.526**	.687**	.610**	1.000
	Sig. (2-tailed)	.000	.000	.000	.000	.
	N	114	114	114	114	114

** Correlation is significant at the 0.01 level (2-tailed).

7.4.2. Propositions and Hypotheses Testing for Research Question 2

According to research question 2, results from questionnaires in Appendix I section 1, section 2, and section 3 were used to evaluate the weak points of the team which has less contribution to succession of new product introduction in the case company. Improvement points will be suggested upon finding.

Research Question 2: Which improvements should be implemented to improve these practices?

According to the evaluation results in section 7.3 regarding the effect of company capabilities in Knowledge Integration, Problem Solving and Uncertainty Reduction, Continuous Concurrency, and Simplicity in contribution to succession of new product introduction, the results indicated that all of the company's capabilities have significant positive linear relationship to succession of new product introduction. It means that the higher level of team performance will be resulted in the higher level of succession of new product introduction project.

In order to improve team's performances for more contribution in fast and effective new product introduction process, questionnaires from Appendix I in section 2 were asked in order to evaluate the improvement points.

7.4.2.1. Problem facing in Knowledge Integration

Respondents were asked to answer the question, what do you see as the largest problem within your NPI project for *team ability in knowledge sharing and leaning?*

Results are presented in following table.

Table 7.37: Descriptive statistical results of problem facing regarding knowledge integration

		Problem Knowledge			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Team technical/knowledge background	43	37.7	37.7	37.7
	Knowledge sharing with customer	26	22.8	22.8	60.5
	Knowledge sharing with supplier	27	23.7	23.7	84.2
	Knowledge sharing with in the team	18	15.8	15.8	100.0
	Total	114	100.0	100.0	

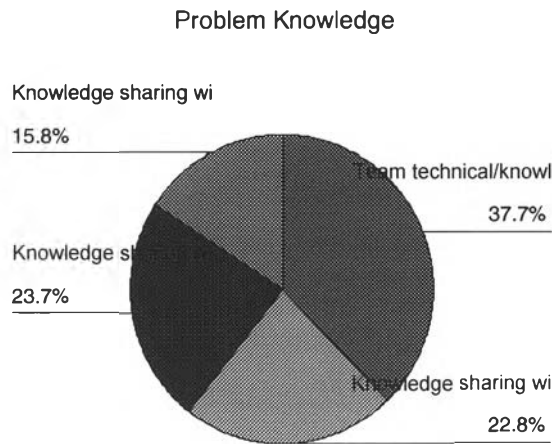


Figure 7.33: Evaluation results of problem facing regarding knowledge integration

The results of the questionnaire showed that 37.7% of respondents thought that their team has low technical/ knowledge background of the project, 22.8% of respondents thought that their team has less information/ knowledge sharing with customer, 23.7% of respondents thought that their team has less information/ knowledge sharing with supplier, 15.8% of respondents thought that their team has less information/ knowledge sharing within team.

Based on the result, it indicated that the most critical problem that the company is now facing is low technical or knowledge background of the project. Sharing information between customer, supplier, and team are the next problems that the company also facing.

In order to verify the relationship between project in experience and the problem within NPI project for team ability in knowledge sharing and leaning, Chi-square test was employed.

Table 7.38: The cross-tabulation result between project in experience and the problem facing regarding knowledge integration

Problem Knowledge * Project in experience Crosstabulation

Count		Project in experience				Total
		1 - 2 projects	3 - 4 projects	5 - 6 projects	7 projects and more	
Problem Knowledge	Team technical/knowledge background	34	4	3	2	43
	Knowledge sharing with customer	16	6		4	26
	Knowledge sharing with supplier	19	4		4	27
	Knowledge sharing with in the team	12	6			18
Total		81	20	3	10	114

Table 7.39: The relationship between project in experience and the problem facing regarding knowledge integration

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.347 ^a	9	.082
Likelihood Ratio	17.337	9	.044
Linear-by-Linear Association	.041	1	.840
N of Valid Cases	114		

a. 11 cells (68.8%) have expected count less than 5.
The minimum expected count is .47.

The results in Chi-Square tests table (above) suggest that there is no relationship between project in experience and problem in knowledge background or knowledge sharing, basing on Sign (p) value of (0.082).

However, the test results in this instance is not reliable since eleven cells (68.8%) have expected count less than 5 as indicated under the table. When the percentage exceeds 20%, the Chi-square result becomes unreliable.

7.4.2.2. Problem facing in Problem Solving and Uncertainty Reduction

Respondents were asked to answer the question, what do you see as the largest problem within your NPI project for *team ability in solving problem solving and reduce any uncertainty?*

Results are presented in following table.

Table 7.40: Descriptive statistical results of problem facing regarding problem solving and uncertainty reduction

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Less knowledge in using problem solving&quality control tool	40	35.1	35.1	35.1
Less budget	7	6.1	6.1	41.2
Less time to improve	32	28.1	28.1	69.3
Not enough people to support	9	7.9	7.9	77.2
No data/information available to improve	12	10.5	10.5	87.7
No tool to support	6	5.3	5.3	93.0
No one ever encourage to engage in solving problem	6	5.3	5.3	98.2
No risk management is applied	2	1.8	1.8	100.0
Total	114	100.0	100.0	

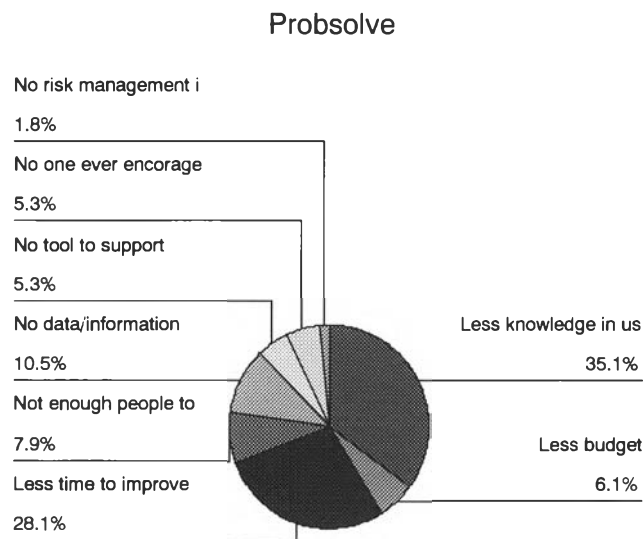


Figure 7.34: Evaluation results of problem facing regarding problem solving and uncertainty reduction

The results of the questionnaire showed that 35.1% of respondents thought that their team has low knowledge background in using problem solving and improvement tools, 28.1% of respondents thought that their team has less time to perform any problem solving and improvement, 10.5% of respondents thought that their team has no data/information available to use for problem solving and improvement, 7.9% of respondents thought that their team has not enough people to perform any problem solving and improvement, 6.1% of respondents thought that their team has less budget to support problem solving and improvement in the project, 5.3% of respondents thought that their team has no tools to support any problem solving and improvement, 5.3% of respondents thought that no one ever encourage to engage in problem solving and improvement, and another 1.8% of respondents thought that there is no risk management applied.

Based on the result, it indicated that the most critical problem that the company is now facing is low knowledge background in using problem solving and improvement tools. Less time to perform any problem solving and improvement and no data/information available to use for problem solving and improvement are the next critical problems that the company also facing.

In order to verify the relationship between past experience and the problem within NPI project for team ability in solving problem and reduce any uncertainty, Chi-square test was employed.

Table 7.41: The cross-tabulation result between project in experience and the problem facing regarding problem solving and uncertainty reduction

Probsolve * Project in experience Crosstabulation

Count		Project in experience				Total
		1 - 2 projects	3 - 4 projects	5 - 6 projects	7 projects and more	
Probsolve	Less knowledge in using problem solving&quality control tool	32	2	2	4	40
	Less budget	6		1		7
	Less time to improve	14	14		4	32
	Not enough people to support	5	2		2	9
	No data/information available to improve	12				12
	No tool to support	6				6
	No one ever encourage to engage in solving problem	4	2			6
	No risk management is applied	2				2
Total	81	20	3	10	114	

Table 7.42: The relationship between project in experience and the problem facing regarding problem solving and uncertainty reduction

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	40.070 ^a	21	.007
Likelihood Ratio	44.592	21	.002
Linear-by-Linear Association	1.246	1	.264
N of Valid Cases	114		

a. 26 cells (81.3%) have expected count less than 5.
The minimum expected count is .05.

The results in Chi-Square tests table (above) suggest that there is a strong relationship between project in experience and team ability in solving problem and reduce any uncertainty, basing on Sign (p) value of (0.007).

However, the test results in this instance is not reliable since eleven cells (81.3%) have expected count less than 5 as indicated under the table. When the percentage exceeds 20%, the Chi-square result becomes unreliable.

7.4.2.3. Problem facing in Continuous Concurrent

Respondents were asked to answer the question, what do you see as the largest problem within your NPI project for *team ability in managing tasks and coordination with external team and intenal team.*

Results are presented in following table.

Table 7.43: Descriptive statistical results of problem facing regarding continuous concurrency

Continous concurrent

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low performance in task management	23	20.2	20.2	20.2
Less cooperation with customer	30	26.3	26.3	46.5
Less cooperation with supplier	6	5.3	5.3	51.8
Less cooperation within team	14	12.3	12.3	64.0
Less support from management / product champion	8	7.0	7.0	71.1
Less mutidiscipline team	29	25.4	25.4	96.5
Other	4	3.5	3.5	100.0
Total	114	100.0	100.0	

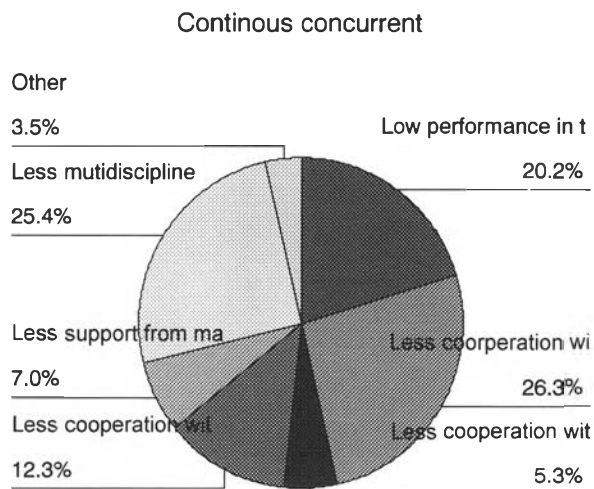


Figure 7.35: Evaluation results of problem facing regarding continuous concurrency

The results of the questionnaire showed that 26.3% of respondents thought that their team has less communication and cooperation between team and customer, 25.4% of respondents thought that their team has less multi-discipline team or not enough people

to perform any specific tasks, 20.2% of respondents thought that their team has low performance in task management, 12.3% of respondents thought that their team has less communication and cooperation within team, 7.0% of respondents thought that their team has low support from management or project champion, 5.3% of respondents thought that their team has less communication and cooperation between team and supplier, and another 3.5% of respondents thought that their team has low communication or language skills.

Based on the result, it indicated that the most critical problem that the company is now facing is less communication and cooperation between team and customer. Less multi-discipline team or not enough people to perform any specific tasks and low performance in task management are the next critical problems that the company also facing.

In order to verify the relationship between project in experience and the problem within NPI project for team ability in managing tasks and coordination with external team and internal team, Chi-square test was employed.

Table 7.44: The crosstabulation results between project in experience and the problem facing regarding continuous concurrency

Continuous concurrent * Project in experience Crosstabulation

Count		Project in experience				Total
		1 - 2 projects	3 - 4 projects	5 - 6 projects	7 projects and more	
Continuous concurrent	Low performance in task management	14	2	3	4	23
	Less cooperation with customer	28	2			30
	Less cooperation with supplier	2			4	6
	Less cooperation within team	12	2			14
	Less support from management / product champion	6			2	8
	Less multidiscipline team	17	12			29
	Other	2	2			4
Total		81	20	3	10	114

Table 7.45: The relationship between project in experience and the problem facing regarding continuous concurrency

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	68.238 ^a	18	.000
Likelihood Ratio	57.899	18	.000
Linear-by-Linear Association	.371	1	.543
N of Valid Cases	114		

a. 21 cells (75.0%) have expected count less than 5.
The minimum expected count is .11.

The results in Chi-Square tests table (above) suggest that there is a strong relationship between project in experience and team ability in managing tasks and coordination with external team and intenal team, basing on Sign (p) value of (0.000).

However, the test results in this instance is not reliable since eleven cells (75.0%) have expected count less than 5 as indicated under the table. When the percentage exceeds 20%, the Chi-square result becomes unreliable.

7.4.2.4 Problem facing in Simplicity

Respondents were asked to answer the question, what do you see as the largest problem within your NPI project for *team ability to reduce complexity in product, process, system, documentation, and organization*.

Results are presented in following table.

Table 7.46: Descriptive statistical results of problem facing regarding simplicity

Simplicity

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low flexibility and response to change in design/developpe	40	35.1	35.1	35.1
Organization does not support in increasing	14	12.3	12.3	47.4
Low support from management/product champion	8	7.0	7.0	54.4
No support tools available	18	15.8	15.8	70.2
No standard procedure	11	9.6	9.6	79.8
No generic method use to guide project planning	7	6.1	6.1	86.0
No project performance evaluation is applied	16	14.0	14.0	100.0
Total	114	100.0	100.0	

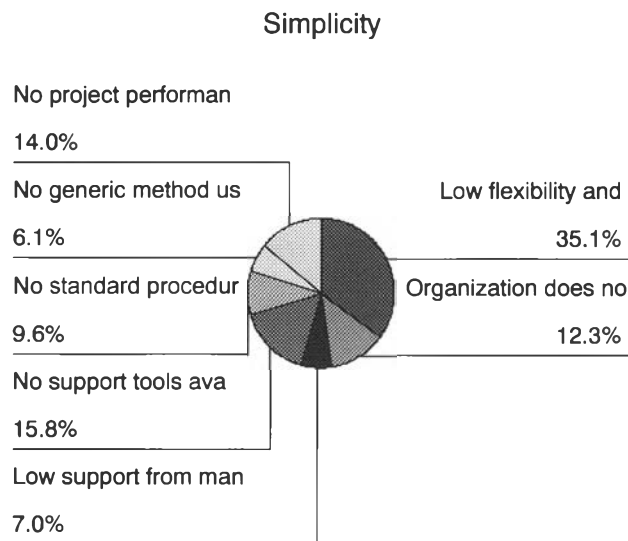


Figure 7.36: Evaluation results of problem facing regarding simplicity

The results of the questionnaire showed that 35.1% of respondents thought that their team has low flexibility and low response to change in design and development, 15.8% of respondents thought that their team has no support tools available such as computer based- tools, prototype, quality tools, etc., 14.0% of respondents thought that there is no procedure or method use to evaluate the project performance and status against customer requirements, 12.3% of respondents thought that organization does not support in increasing decision-making authority and lower level in team, 9.6% of respondents thought that there is no standard procedures use for carrying out the NPI project, 7.0% of respondents thought that their team has low support from management or project champion, and another 6.1% of respondents thought that there is no generic method use to guide project planning.

Based on the result, it indicated that the most critical problem that the company is now facing is low flexibility and low response to change in design and development. No support tools available such as computer based- tools, prototype, quality tools, etc. and no procedure or method use to evaluate the project performance and status against customer requirements, are the next critical problems that the company also facing.

In order to verify the relationship between project in experience and the problem within NPI project for team ability in reducing complexity in product, process, system, documentation, and organization, Chi-square test was employed.

Table 7.47: The crosstabulation results between project in experience and the problem facing regarding simplicity**Simplicity * Project in experience Crosstabulation**

Count		Project in experience				Total
		1 - 2 projects	3 - 4 projects	5 - 6 projects	7 projects and more	
Simplicity	Low flexibility and response to change in design/develop	26	12	2		40
	Organization does not support in increasing	12	2			14
	Low support from management/product champion	4			4	8
	No support tools available	10	2		6	18
	No standard procedure	10		1		11
	No generic method use to guide project planning	5	2			7
	No project performance evaluation is applied	14	2			16
Total		81	20	3	10	114

Table 7.48: The relationship between project in experience and the problem facing regarding simplicity**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	50.909 ^a	18	.000
Likelihood Ratio	48.765	18	.000
Linear-by-Linear Association	.276	1	.599
N of Valid Cases	114		

a. 21 cells (75.0%) have expected count less than 5.
The minimum expected count is .18.

The results in Chi-Square tests table (above) suggest that there is a strong relationship between project in experience and team ability in reducing complexity in product, process, system, documentation, and organization, basing on Sign (p) value of (0.000).

However, the test results in this instance is not reliable since eleven cells (75.0%) have expected count less than 5 as indicated under the table. When the percentage exceeds 20%, the Chi-square result becomes unreliable.