Report on the Survey

"Distribution of Customized Project or System Requirements Specifications (SRS) To Different Project Stakeholders"

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Acknowledgement

I am very grateful to all the PMI members as well as all my ex-colleagues, friends and their contacts who have responded to my survey, without your participation and support, my research would not have been achievable.

Finally, if you have any queries or any other feedback or comments that you wish to share with me with regards to this research or the SRS Customization Framework, please email me at mokwm@singnet.com.sg

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Introduction

This survey is part of a research to identify the set of criteria that may be applied to customize Project or System Requirements Specifications (SRS) for different project stakeholders.

Purpose of Survey

The purpose of this survey is:

1. to find out how SRS are currently being distributed to different project stakeholders, whether in full or customized based on some criteria such as the role(s) of the stakeholder, and the activities they are participating in
2. to determine the set of criteria that are currently applied by project managers (if any) who practices the distribution of customized SRS
3. to identify the set of criteria or dimensions that can be applied to prepare customized SRS for different stakeholders through respondents' feedback
4. to recognize what SRS information (based on a renowned SRS template) would be classified as essential and optional for different project stakeholders
5. to discern the stakeholder roles that are considered critical, essential and non-essential
6. to establish the type of SRS information that are relevant to critical, essential and non-essential stakeholders
7. to understand the level of awareness and application of SRS standards in the project management profession
8. to determine the current level of awareness and adoption of Requirements Management software Tools (RMT).

Data Collection

Two sample populations were surveyed. A local sample based in Singapore is formed by contacts using the convenience and snowball sampling methods. The other sample comprises the Project Management Institute (PMI) members. This dual sampling strategy applies the concept of triangulation (Kitchenham July 2004) to enable the cross-examination or double checking of the survey outcomes from two different audiences. The local sample also serves as a contingent plan to ensure the success of this survey.

The online survey for the local sample was conducted from 11 September to 27 September 2005 attracting an audience of 103 but only 32 of the respondents completed the survey fully.

The online survey for the PMI sample started on 19 October 2005 and ended on 8 February 2006. It attracted an audience of 412 PMI members with 56 respondents completing the survey in full.

Hence the consolidated sample (local and PMI samples) clocked a total of 88 worldwide respondents.

Both surveys were held at www.questionpro.com

Summary of Main Conclusions

Both the local and PMI samples' respondents have diverse experience and regional exposure, their average number of years of experience is 4 years and they have on average experienced five different project stakeholder roles.

A cluster analysis revealed that the integrated sample embraces three clusters. These clusters are centered by :

- the total number of stakeholder roles that the respondents have experienced
- the years of project management experience that they possess
- the number of regions that they have worked in, and
- the total number of countries that they have worked in.

Thus, there are no significant behavioural or cultural differences between the local and PMI samples.

Furthermore, more than 70% of the pooled sample's respondents have experience in the creation of SRS. Hence, the findings from this exercise are believed to represent a fair and true view of how SRS is currently being distributed (in full/part) and provide an insight to the potential criteria that can be applied to customize SRS.

The most significant overall findings are :

1. 43% of all the respondents presently distribute the SRS in full to different stakeholders and they continue to uphold their belief that SRS should not be customized. More than one third (37%) distribute customized SRS and 14% do not distribute any SRS at all.
2. From the respondents' feedback on customized SRS, 43% continue to support the distribution of the SRS in full. Nearly 40% support the idea of customized SRS with another 15% of the respondents in favour of distributing both the full and customized versions.
3. The set of criteria that are <u>currently</u> applied by some project managers to produce customized SRS include :
    a. the needs of the stakeholders in view of project sensitivity or confidentiality
    b. the activities that the stakeholders are involved in
    c. the role performed by the stakeholders.

4. Based on the respondents feedback, the criteria that may be applied to customize SRS include :
    a. the role performed by the stakeholders
    b. the activities that the stakeholders are involved in
    c. the needs of the stakeholders in view of project sensitivity or confidentiality
    d. the position or authority of the stakeholder
    e. the status of the stakeholder, that is internal to or external of the organization
    f. the importance of the stakeholder that is critical, essential or non-essential stakeholder.
5. Other potential criteria that were suggested by the respondents to customize the SRS include :
    a. the nature of the stakeholder type that is technical or non-technical
    b. the organization policy
    c. the motivation level of the stakeholder that is based on their willingness to be involved or how much they want to know
    d. the stakeholder's position as formal or informal leaders
    e. the size of the project
    f. the complexity of the project
    g. the required level of integration for the product, for instance the number of different business domains that need to be integrated or the number of existing application systems that need to be integrated with it or the number of external stakeholders or systems that need to be linked
    h. various combinations of the criteria stated above and the six criteria stated in point 4.
6. The awareness and adoption of various requirements specifications standards are still not high (less than 30%), likewise the usage of Requirements Management Tools (RMT) is still lacking, as only 21% possess experience with such tools.
7. Generally, the PMI respondents do not support the idea of distributing customized SRS. However, this result is not aligned with the results gathered from the last part of the survey that seek their opinion on which sections of the SRS that should be distributed to the different stakeholders.

8. The local sample is more receptive and supportive of distributing customized SRS to the various stakeholders (69%) when compared to the PMI sample (around 21%). The overall support level for customized SRS for the pooled sample is nearly 40%.
9. The set of SRS customization criteria favored by both the local and PMI samples are quite aligned. The top two criteria are stakeholder role and project activity. The other potential criteria cover stakeholder's need according to project sensitivity or confidentiality, stakeholder's position or authority, stakeholder's status (internal or external of the organization) and stakeholder's importance (critical, essential or non-essential stakeholder).
10. Females (more than half) are more supportive of distributing customized SRS when compared to the males (nearly one third).
11. The two genders have different preferences in terms of the SRS customization criteria. The males prefer authority or position and the importance of the stakeholder (key, secondary or unimportant) while females opted for roles, activities involved, stakeholders needs that are based on project confidentiality or sensitivity and whether the stakeholders are internal or external of the organization.
12. Only one respondent voted for ALL the different listed sections of an SRS to be distributed to all the different stakeholders.
13. Since 64% of the PMI respondents slant towards distributing the full SRS to all the stakeholders, it came as a surprise that they did not uphold their preference by voting positively for all the different SRS sections to be distributed to the different stakeholders. The resultant support level for the various SRS sections ranges from a low of 1.8% to a high of 34%, the average is 15.6% and the median is 16%.
14. The local sample is more predictable, as they are more forthcoming with the idea of distributing customized SRS, the level of support for the individual sections of the SRS to be distributed to different stakeholders showed a low of 3.1% to a high of 81.3% with an average of 42.4%, and a median of 50%.
15. The group of stakeholders that are considered critical include project manager, customer or user, financial beneficiary, technical designer, project champion, business analyst and requirements engineer.
16. The group of stakeholders that are considered essential include programmer, testing specialist, vendor representative, consultant, negative stakeholder, business domain expert, operational support and maintenance operator.
17. The only stakeholder considered to be non-essential is the packaging designer.

18. None of the SRS sections are mandatory for all the stakeholders although it is clear from this research that different SRS sections have different level of relevance to different classifications of stakeholders.
19. The set of criteria that may be applied to customize SRS may be classified into four clusters :

- Project related :
    - Project Activities
    - Project Sensitivity and Confidentiality
    - Project Size
    - Project's Level of Complexity
    - Project's Level of Integration
    - Project Type (new, change or maintenance)
- Organizational related :
    - Organization Policy
    - Business Goals
- Requirements related :
    - Mandatory vs Optional Requirements
    - High-level or general Requirements vs Technical Requirements
- Stakeholder related :
    - Stakeholder's Importance (critical, essential, non-essential)
    - Stakeholder's Role
    - Stakeholder's Nature (technical or non-technical)
    - Stakeholder's Status (internal or external of organization)
    - Stakeholder's Involvement Stage (Initiation or post-Initiation stage)
    - Stakeholder's Position or authority
    - Stakeholder's Motivation level or willingness to be involved
    - Stakeholder's Position (formal or informal leader).

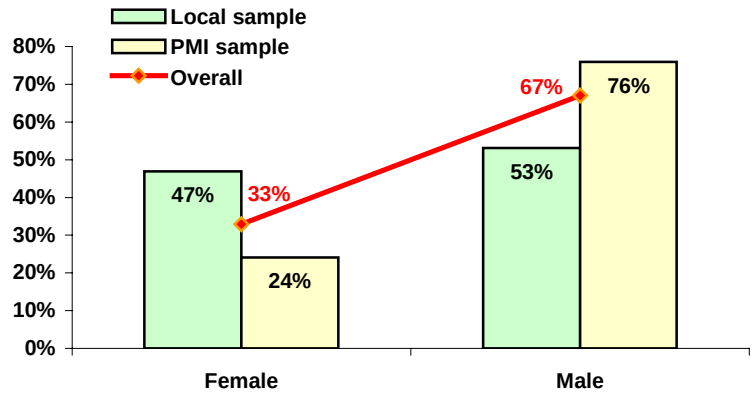
In conclusion, there is a community that practices and supports the distribution of customized SRS and there exists a set of criteria that can be applied to customize SRS.

Detailed Survey Results

Respondents Profile

The local sample based in Singapore comprises an almost equal number of male and female respondents while the PMI sample includes a quarter of female and three-quarters of male respondents. In totality, the consolidated sample has one third of female and two-thirds of male respondents.

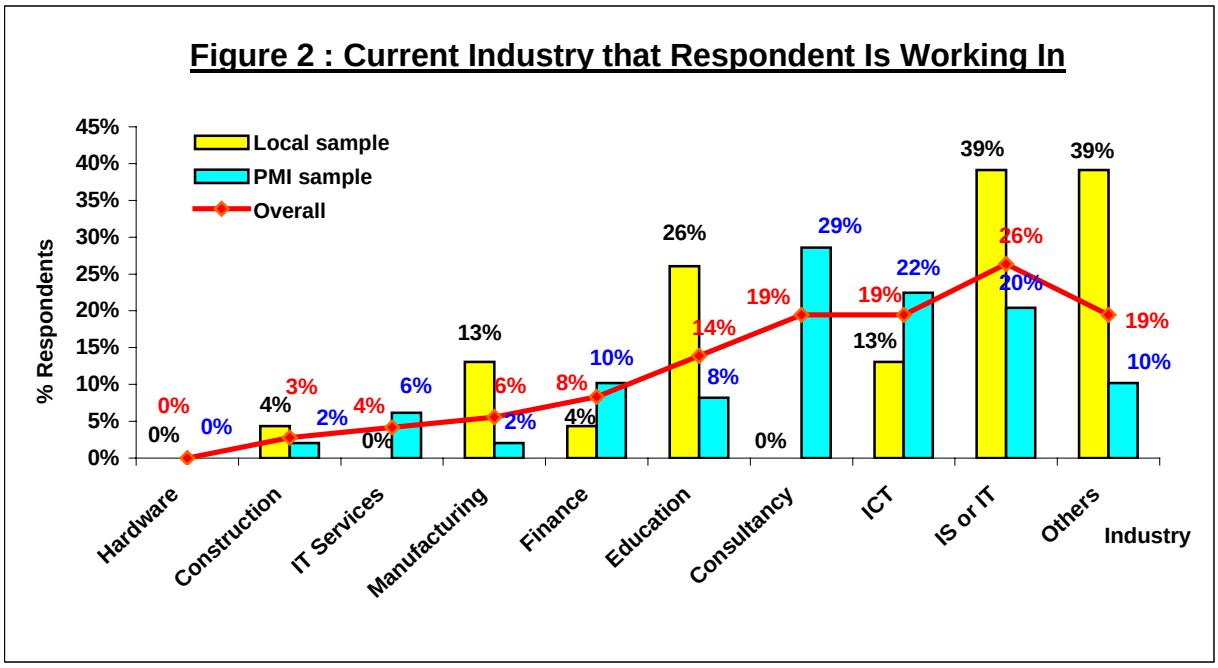
Figure 1 : Distribution of Gender



About half of the respondents are working in computer related industries (Information-Communication Technologies (ICT), IS (Information Systems), IT (Information Technology) and IT Services). For the local sample this stood at 52% (13%+39%), for the PMI sample it is 48% (6%+22%+20%), which works out to be 49% (4%+19%+26%) for the pooled sample.

With reference to Figure 2, the modal industry for the local sample is IS or IT (39%) while the PMI sample records the most significant percentage lies in consultancy (29%).

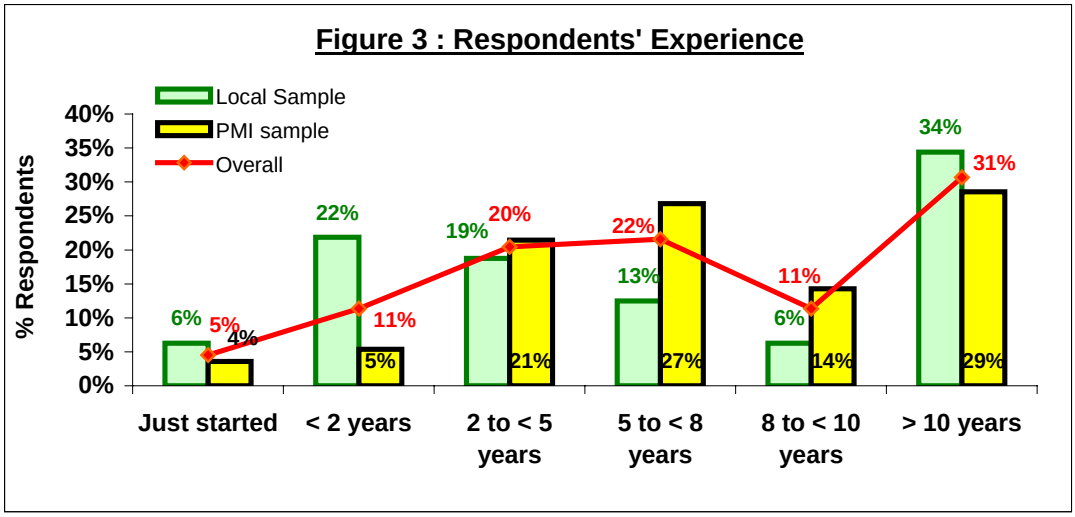
Figure 2 : Current Industry that Respondent Is Working In



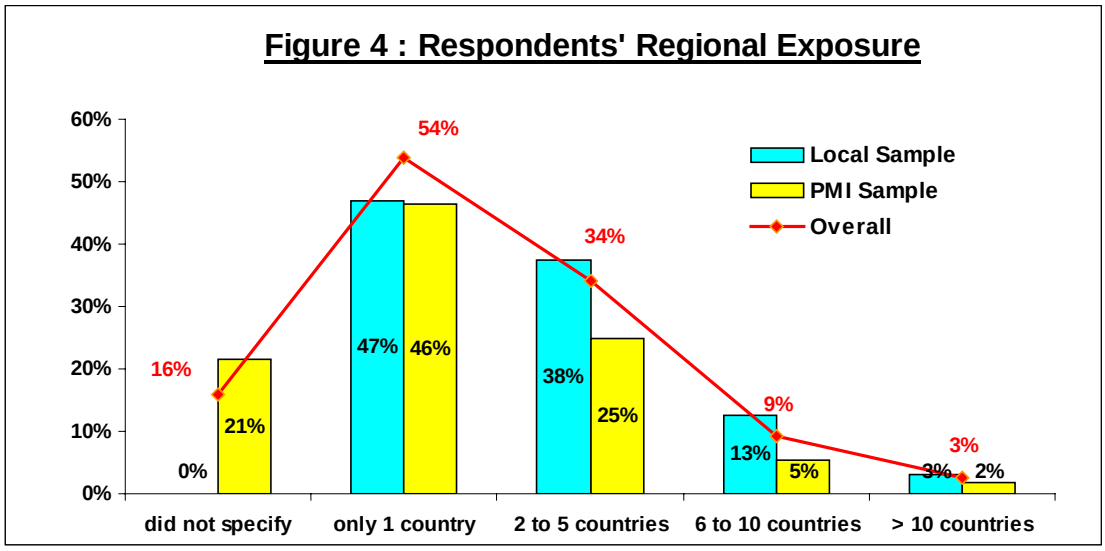
The local sample has a higher percentage of less experienced (up to two years : 28%) respondents when compared to the PMI sample (9%). Hence, overall 16% of the respondents have less than two years of experience.

At least half of the respondents in both the local and PMI samples possess at least five years of experience (53% for the local sample and 70% for the PMI sample). The pooled sample therefore recorded 64% of the respondents with at least five years of experience.

The average number of years of experience for the local, PMI and pooled samples are similar at four years as shown in Figure 3.

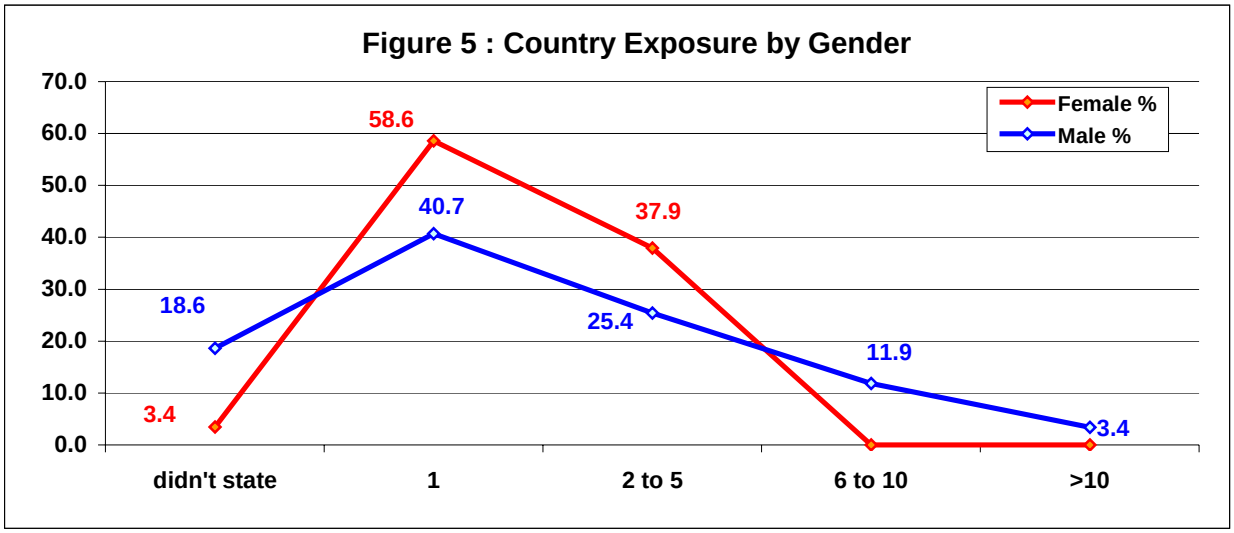


Based on the number of countries that the respondents have worked in, the local sample has greater exposure (54% worked in more than 1 country) as depicted in Figure 4 as compared to the PMI sample (32%). Overall about half (46%) of all the respondents have worked in more than one country.



Further analysis by regions (Asia, Australia and New Zealand, Europe, Latin America, Middle East, United States of America (USA) and Africa) reflects that the local sample's experience is skewed towards Asia while the PMI sample is slanted towards the USA. Overall, the pooled sample records one third of the respondents with USA exposure and two-thirds with Asian experience, and approximately 12% have worked in more than one region.

A higher percentage of males travel on the job and more extensively when compared to the females. Females typically worked in a single location and travel to a maximum of five countries. Males dominate working in more than five countries as illustrated in Figure 5.



Overall the respondents in both the local and PMI samples have experience in multiple stakeholder roles; only a minority of about 10% has experience in a limited number of roles (Figure 6). All the listed stakeholder roles logged at least two respondents who have experience in them. The Packaging Designer role has the lowest count of two respondents (2.3%) while project manager role has the highest occurrence at 68 (77.3%) respondents.

In addition, Figure 6 also reflects that the PMI sample exhibited a wider exposure to the different types of roles as compared to the local sample. Consistently 'six types of roles' is the modal class for all the different samples including the pooled sample. On average each respondent has experienced five different types of stakeholder roles.

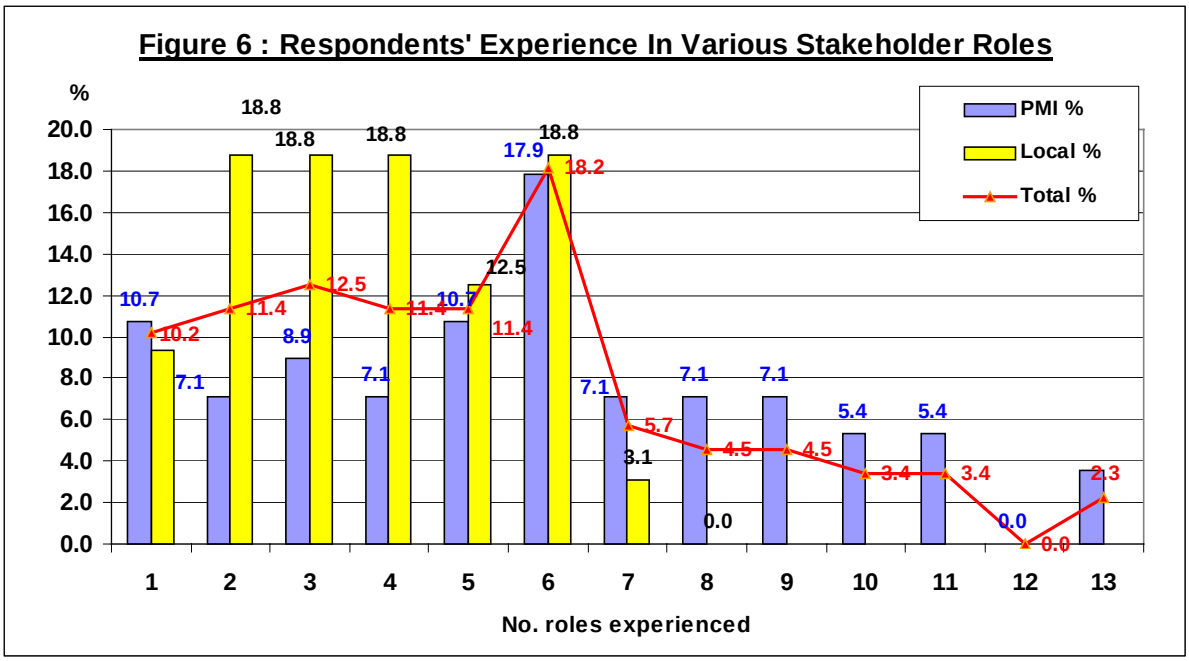
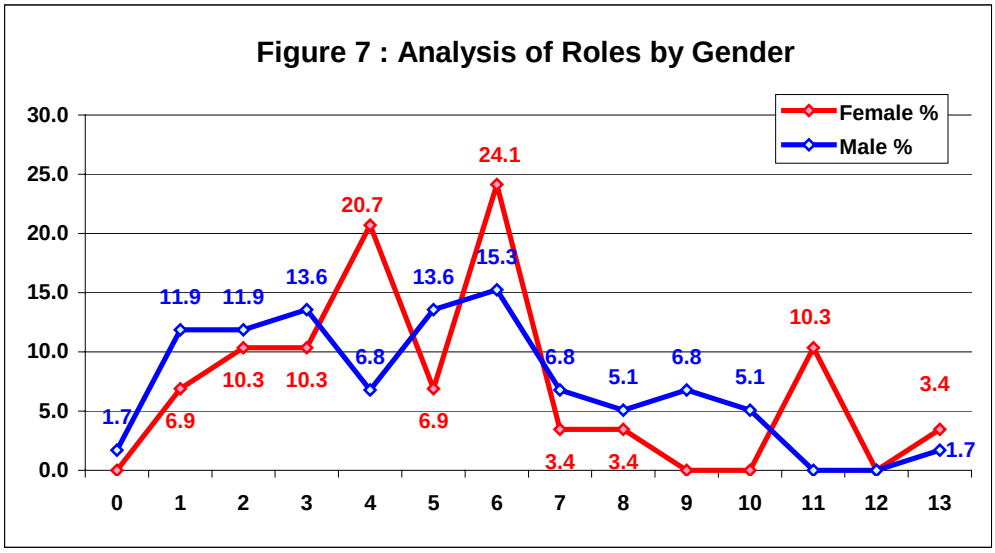


Figure 7 further reveal that females possess greater experience in 4, 6 and 11 types of roles while the spread for males tend to be quite even from 1 to 6 types of roles (range from 12% to 15%), and beyond 6, up to 10 types of roles the level of support is at the 5% to 10% band.



It is also observed that females generally have a greater exposure to different roles. This is because the percentage of females with up to 3 types of roles' experience is around a quarter (27%) but more than one-third (37%) of the males are in this category.

Likewise, more than half (52%) of the female respondents have experience in 4 to 6 types of roles but only about a third (36%) of the males fall into this basket.

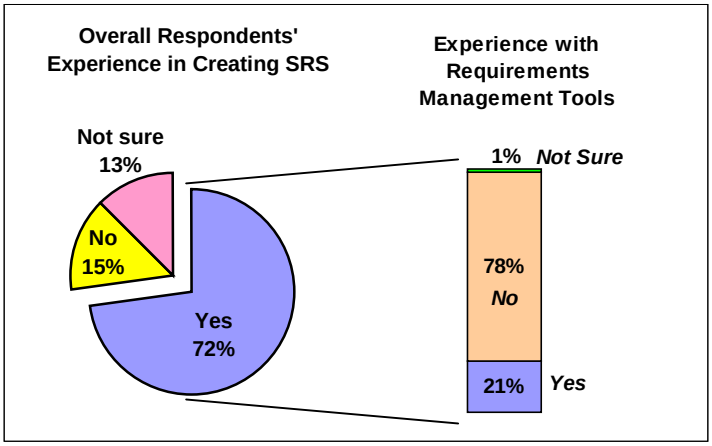
Categorically, it is unusual for a respondent to possess experience with more than six types of roles. Females recorded less than a quarter (20.5%) while males barely reached the quarter level (25.5%).

Findings from Analyzing the Collected Feedback

The survey (Figure 8) shows that more PMI members (80%) have experience creating SRS than the local sample (60%). Consequently, only 72% of the pooled sample possesses experience creating the SRS. Furthermore, only 21% of this group of respondents has used a Requirements Management Tool (RMT) to create and manage their SRS.

The adoption of SRS standards lags their awareness. Overall, a third of the pooled sample have knowledge of the IEEE 1233-1998 standard (Guide for Developing System Requirements Specifications), a quarter for the ISO/IEC 12119-1994 (Information Technology - Software Packages - Quality Requirements and Testing) and nearly a quarter (23%) for the IEEE 830-1998 standard (Recommended Practice for Software Requirements Documentation).

Figure 8 : Experience in Creating SRS vs the Usage of RMT



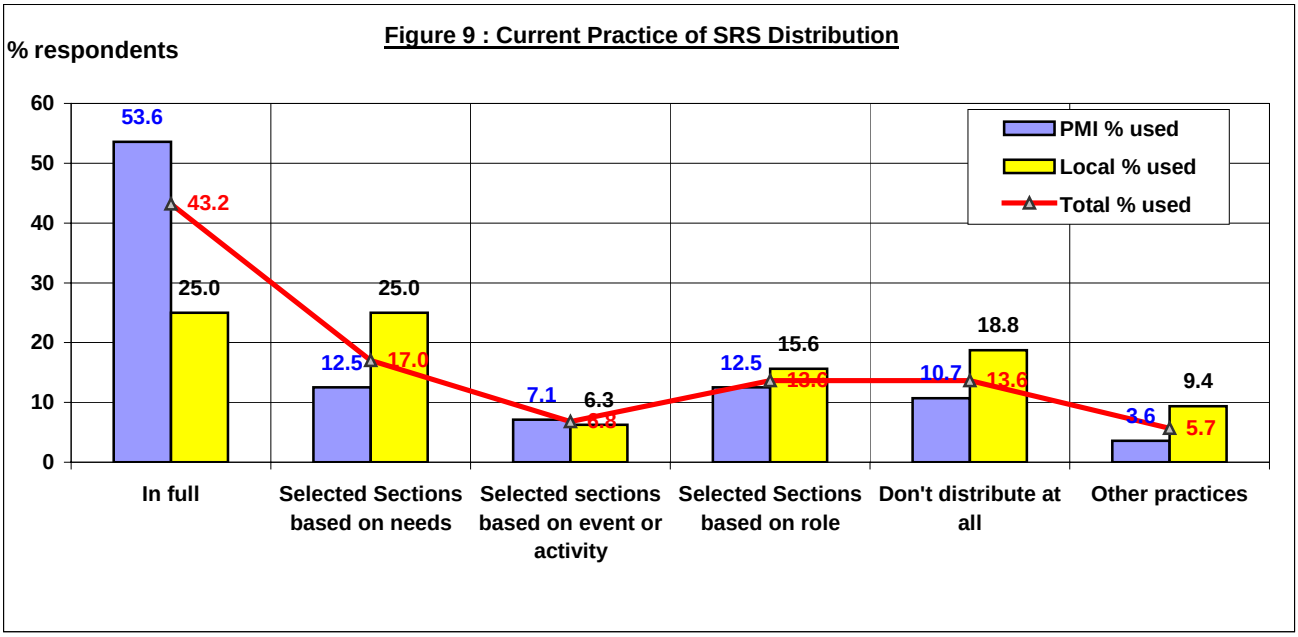
presently, more than half of the PMI members (53.6%) distribute SRS in full to their stakeholders as compared to a quarter for the local sample.

As observed in Figure 9, the local scene is more prone to distributing customized SRS, which is nearly half the respondents (25+6.3+15.6 = 46.9%) in contrast to the PMI sample's of less than a third of respondents (12.5+7.1+12.5 = 32.1%).

Almost 19% of the local respondents do not distribute the SRS to any stakeholders at all. Comparatively 11% of the PMI sample does not distribute the SRS at all.

Resultantly, based on the overall pooled sample, more than 40% of the respondents distribute SRS in full, more than a third (37.4%) distribute customized SRS and nearly 14% do not distribute any SRS at all.

Figure 9 : Current Practice of SRS Distribution



Setting aside the current practice, the respondents were asked for their opinion on how SRS may be customized. The support for the distribution of customized SRS receives greater support from the female respondents (Figure 10). More than half of them (52%) support this idea as compared to a third (32%) of males.

It was also found that males prefer to customize SRS by authority, position or the importance of the stakeholder (key, secondary or unimportant) while females favour SRS customization by roles, activities involved, project confidentiality or sensitivity and whether the stakeholders are internal to or external of the organization.

Comparing the current practice (Figure 9) and the feedback on whether SRS should be customized (Figure 11), an additional 10% of the PMI respondents felt that the SRS should be distributed in full although the support for customized SRS has also increased, although this is marginal at about 4%.

In contrast, there was a marked decline for the local sample to distribute the SRS in full (by almost 19%) with an exorbitant increase (38%) to distribute customized SRS.

However, analyzing the pooled sample revealed that the overall support to distribute SRS in full remain unchanged at the 43% mark, and the increase in support for customized SRS is really due to the pool of respondents who now support the distribution of the SRS both in full and customized.

Figure 10 : Pro-distribution of SRS by criteria (by Gender)

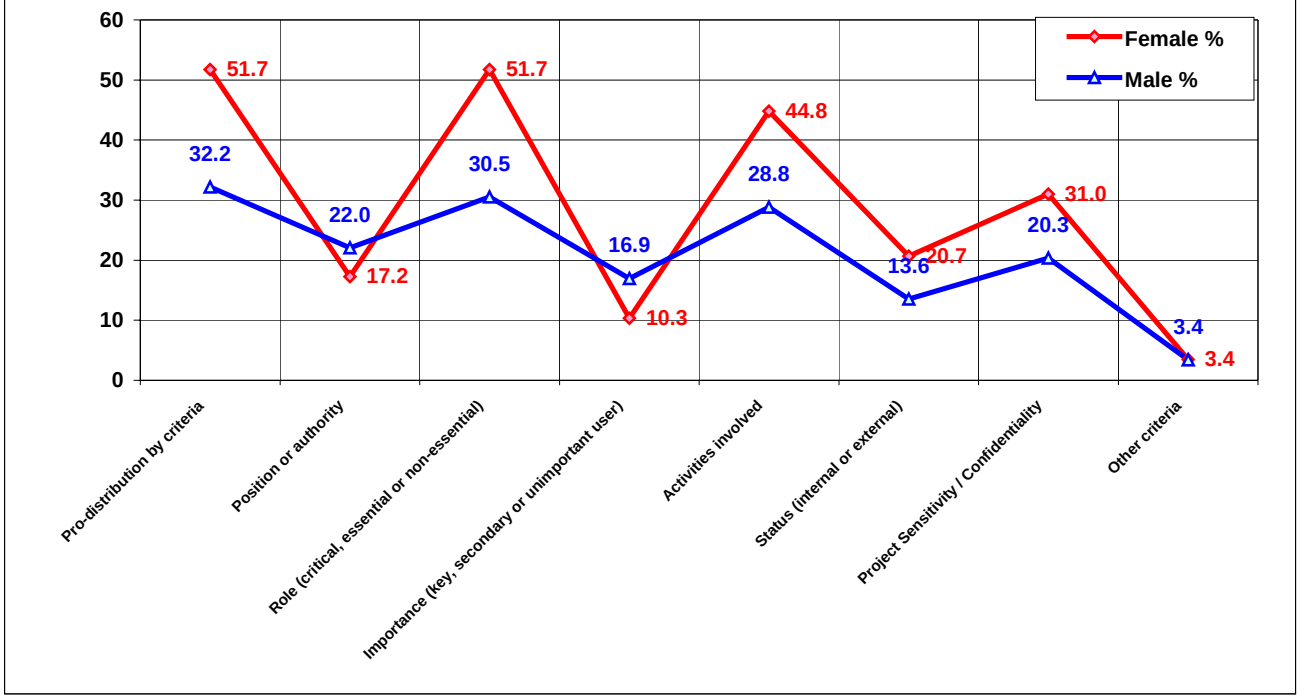
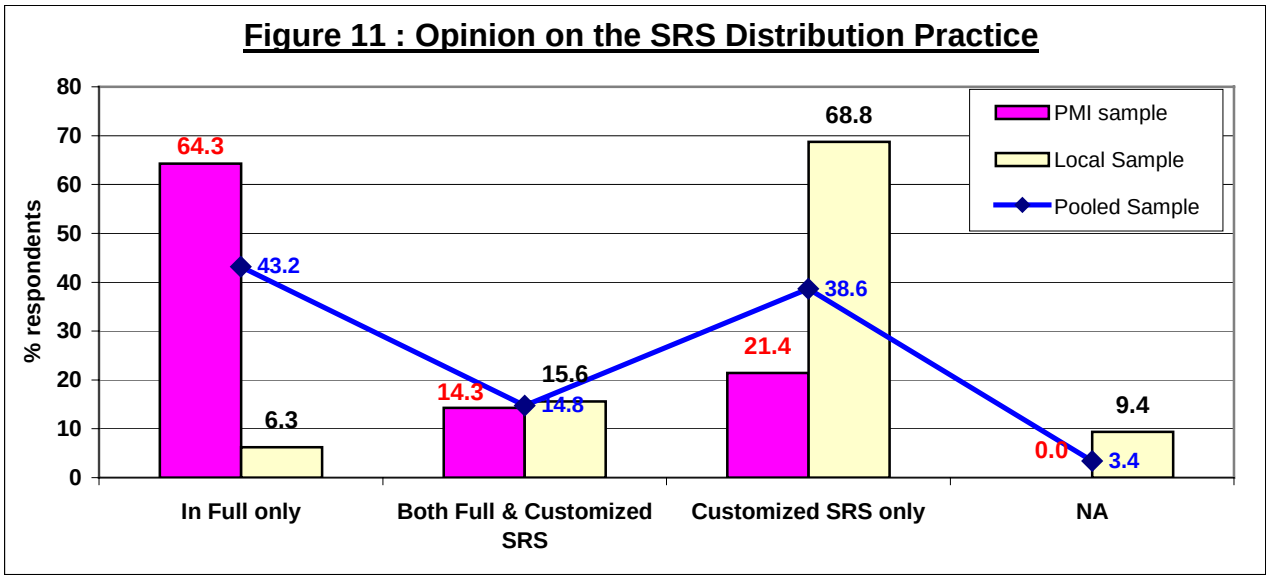


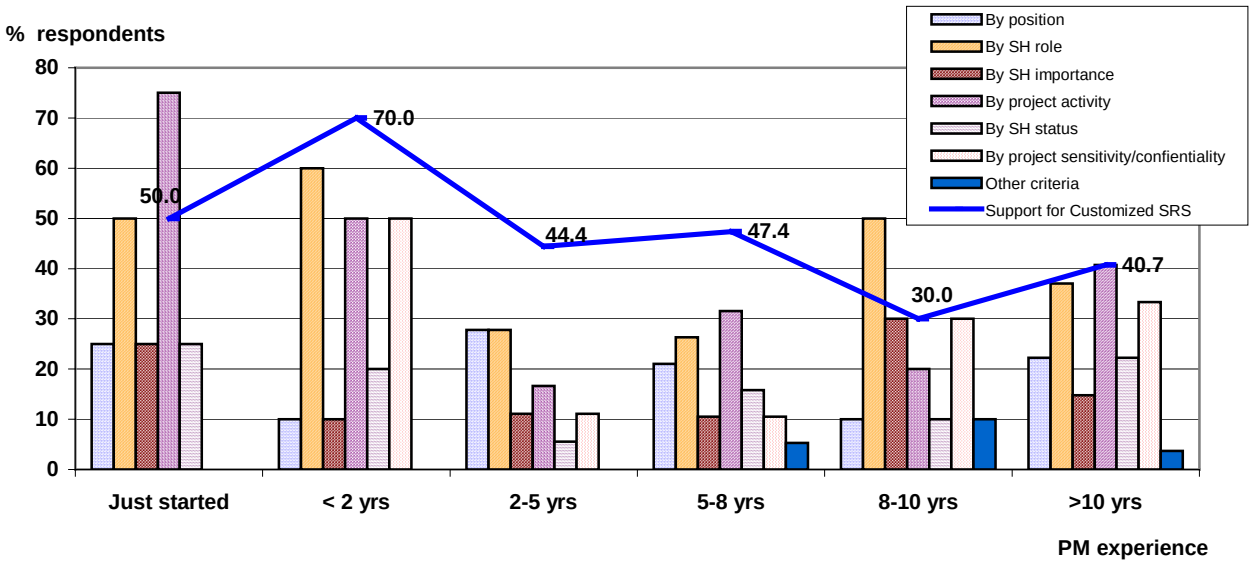
Figure 11 : Opinion on the SRS Distribution Practice



It was observed that the respondents with less project management experience (Figure 12) have a higher tendency to support customized SRS.

Further classifying the respondents into three main groups of *Less Experienced* (less than two years of project management experience), *Experienced* (two to eight years of experience) and *Very Experienced* (more than eight years) strengthens this observation as the support level goes onto a sliding scale at 60%, 46% and 35% respectively.

Figure 12 : Support for Customized SRS by Respondents' Yrs of PM Experience



Using this classification to rank the customization criteria preferred by the respondents (Table 1) revealed that the customization criteria could be placed into three baskets of core, key and secondary. The core basket contains criteria with an overall rank of 2, which includes Stakeholders' role and project activity.

The key basket embraces those criteria with an overall rank of 4, that is stakeholder's importance, stakeholder's status, need based on project sensitivity or confidentiality and position or authority.

Table 1 : Ranking of the SRS customization criteria by the Respondents based on the Respondents' years of Project Management Experience

Respondents / Customization Criteria	Less Experienced (at most 2 years)	Experienced (2-8 years)	Very Experienced (at least 8 years)	Overall Ranking (all respondents)	Remarks
By position	5	2	5	4	Inconsistent for the experienced group.
By Stakeholder's role	2	2	2	2	Totally consistent
By Stakeholder's importance	5	5	4	4	Very consistent
By project activity	2	2	3	2	Very consistent
By Stakeholder's status	4	5	5	4	Very consistent
On need basis according to project sensitivity or confidentiality	4	5	3	4	Consistent
Other criteria	7	7	6	7	Very consistent

Finally, the secondary basket holds all those criteria suggested by the respondents that were not listed in the survey. These are the nature of the stakeholder type (technical or non-technical), the organization policy, the motivation level of the stakeholder that is based on their willingness to be involved (formal or informal leaders), the size of the project, the complexity of the project, and the level of integration of the project.

Table 2 : Current practices of distributing SRS by the different sample groups and their level of support for customized SRS

S/No.	Item	Local Sample (%)	PMI Sample (%)	Integrated Sample (%)
	In practice :			
1.	Distribute the SRS in full	25	53.6	43.2
2.	Do not distribute the SRS at all	18.8	10.7	13.6
3.	Distribute **customized SRS** (average of sub-levels 4 to 6)	15.6	10.7	12.5
4.	By type of role eg project manager, client, etc	15.6	12.5	13.6
5.	By activities involved	6.3	7.1	6.8
6.	By need (project sensitivity or confidentiality)	25	12.5	17
7.	Support level **from the Poll for customized SRS**, (average of levels 8 to 13) :	42.7	14	24.5
8.	By type of role	65.6	21.4	37.5
9.	By activities involved	68.8	14.3	34.1
10.	By need (project sensitivity or confidentiality)	43.8	12.5	23.9
11.	By position or authority	34.4	12.5	20.5
12.	By importance (eg critical, essential or non-essential stakeholder or key, secondary or unimportant user)	21.9	10.7	14.8
13.	By status (internal to or external of the organization)	21.9	12.5	15.9

As depicted in Table 2, based on current practices, the local sample is more inclined to distribute customized SRS (the current average is about 16%) when compared to the PMI sample (average is around 11%). It is also notable that the support for customized SRS for all the samples has intensified. For the local sample, the amplification is almost three times of the current practice and for the PMI sample the growth is almost one and a half times the original. Hence, for the pooled sample the increase is two-fold.

Based on the respondents' feedback, the most desirable SRS customization criteria are stakeholder's role and project activity. The other potential criteria include project sensitivity or confidentiality and stakeholder's position or authority, stakeholder's importance and status (internal to or external of the organization).

The main reasons cited for favoring the distribution of the SRS in ***full*** by the stakeholders include :

- To reduce or avoid any risks associated with a fragmented understanding or misunderstanding of the product, which may subsequently cause project failure, schedule and/or budget overrun, design errors that are extremely costly and time-consuming to rectify. This is understandable as Erlikh (2000 cited in Sommerville 2007 p 489) suggested that 90% of software costs are maintenance costs.

  To promote better understanding, one respondent suggested the inclusion of additional information or caveats on who should review what requirements and the status of these requirements, such as 'pending', on hold, 'reviewed' and 'approved'. This recommendation is aligned with PMBOK's Project Communications Management knowledge area (PMI 2004 chpt 10).

  It was further suggested that an explanation of various SRS elements and how these elements are aligned with the business requirements and business rules be included to enhance stakeholders' understanding. This suggestion complies with the Theory of Conscious Alignment shaped by the Stanford Center of Project Management (IPS & SCPM 2002 p i-8). This respondent mentioned the use of an RTM (Requirements Management Tool) to assist him in this regards.

- To ensure the completeness and correctness of the SRS which can be achieved only if all the stakeholders are given the entire SRS for review to identify any gaps or omissions and to correct any errors or misunderstandings in the requirements.

  From this standpoint, it was felt that segmenting the requirements by role would reduce the opportunity for collaborating stakeholders "to recognize and capture missing requirements."

- To ensure that the stakeholders understand the overall system objectives, be aware of all the processes within the system, and how their needs may impact the entire system "beyond their circumscribed" areas such as the consequences of their decisions on the "overall system architecture and project delivery".

- To save time on separating the different requirements which tend to be "interdependent and cannot be easily and unambiguously isolated or separated." Besides, stakeholders are multi-skilled and equipped with multi-disciplinary knowledge, thus "it is growingly imperative to pose questions and comments from various knowledge and experience vectors to them" which defeats the effort to segregate the requirements.

- To allow stakeholders to decide for themselves what they need and extract the relevant information accordingly. It is very difficult to determine precisely who needs what information especially when change is unavoidable.
- To avoid unnecessary speculation on the rationale applied to customize SRS, this will in turn prevent politics and conflicts between different stakeholders.
- To discourage information hiding. Many projects tend to "share very little information, which is a major cause of project failures'.

Stakeholder's Importance

An analysis of the importance (critical, essential or non-essential) of the 16 types of stakeholders (Table 3 and Figures 13 to 16) revealed the following outcome :

1. The ranking for 69% or 11 of the stakeholder roles (Table 3) by the respondents from the PMI and local samples are generally aligned (ranking is considered the same when the difference between the two ranks is either zero, or $\pm$ 1).
2. The ranking (Table 3) for the following five roles were dissimilar :
   a. the PMI sample rated the Financial Beneficiary more critical than the local sample (PMI's rank 3rd against local sample's rank 6th)
   b. the PMI Sample rated the Technical Designer more critical than the local sample (rank 4th as compared to the local sample's rank 6th)
   c. the PMI sample rated Business Analyst more critical or essential than the local sample (PMI's rank 5th against local sample's rank 7th)
   d. the local sample rated the Project Champion more critical or essential than the PMI sample (local sample's rank 4th against PMI's rank 6th)
   e. the local sample rated Requirements Engineer more critical or essential than the PMI sample (local sample's rank 3rd against PMI's rank 7th).
3. The ranking for 'critical stakeholder' between the PMI, local and overall integrated samples are consistent for 81% or 13 types of roles (Figure 16).
4. The ratings for the essential and non-essential stakeholder classifications had greater disparity between the PMI and the local samples (19% and 38% alignment respectively – Table 3 and Figure 16). Likewise, the uniformity in ratings between the local and overall integrated sample is only 50% and 56% while the PMI and overall integrated sample hovered at the 44% and 69% correspondingly.

5. The Packaging Designer (Role 14 in Table 3 and Figure 16) is the only role that received the highest percentage of votes (58%) as a non-essential stakeholder from the PMI sample, although it is considered an essential stakeholder by the local sample (53%). Its overall rating finally staged it in the essential category (47.7%).

6. Based on the integrated sample's importance rating for the 16 roles, the following stakeholders are considered critical (highest percentage of votes received for being a critical stakeholder) :

Stakeholder Role	% Vote	Technical	Non-technical
1. Project Manager	70%	✓	
2. Customer or User	66%		✓
3. Financial Beneficiary	61%		✓
4. Technical Designer, System or Organizational Architect	52%	✓	
5. Project Champion	49%		✓
6. Business Analyst	48%	✓	
7. Requirements Engineer	47%	✓	

7. Likewise, the following stakeholders are considered essential (highest percentage of votes received for being an essential stakeholder) :

Stakeholder Role	% Vote	Technical	Non-technical
1. Programmer	56%	✓	
2. Testing Specialist	53%	✓	
3. Vendor Representative	52%	✓	
4. Consultant	52%	✓	
5. Negative Stakeholder	48%		✓
6. Business Domain Expert	47%		✓
7. Operational Support	37%	✓	
8. Maintenance Operator	34%	✓	

8. The only stakeholder considered to be non-essential is the Packaging Designer (48%).

9. It is noticeable that all the technical staff who are included in the critical stakeholder classification are traditionally those involved from the Initiation (first) stage of the project or product life cycle. In contrast, all those technical staff encompassed in the essential stakeholder classification are those involved in the subsequent stages of the product development life cycle.

Figure 13 : PMI Sample Assessment of Stakeholders' Importance

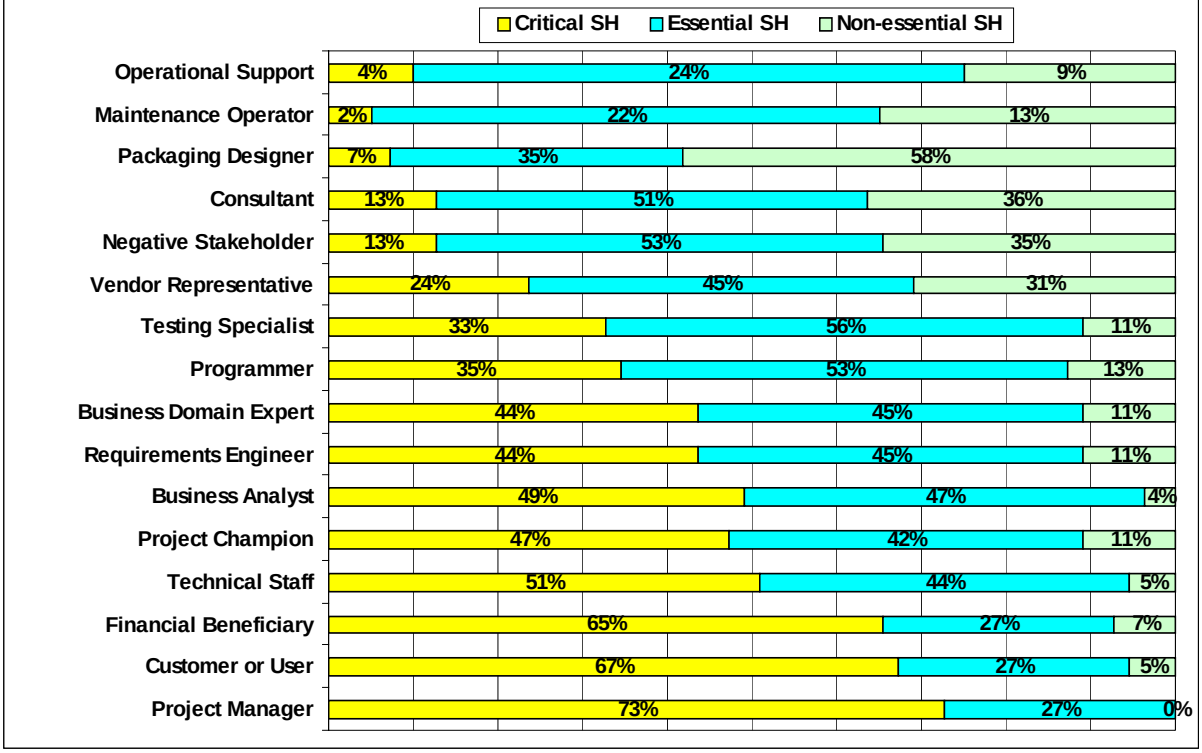
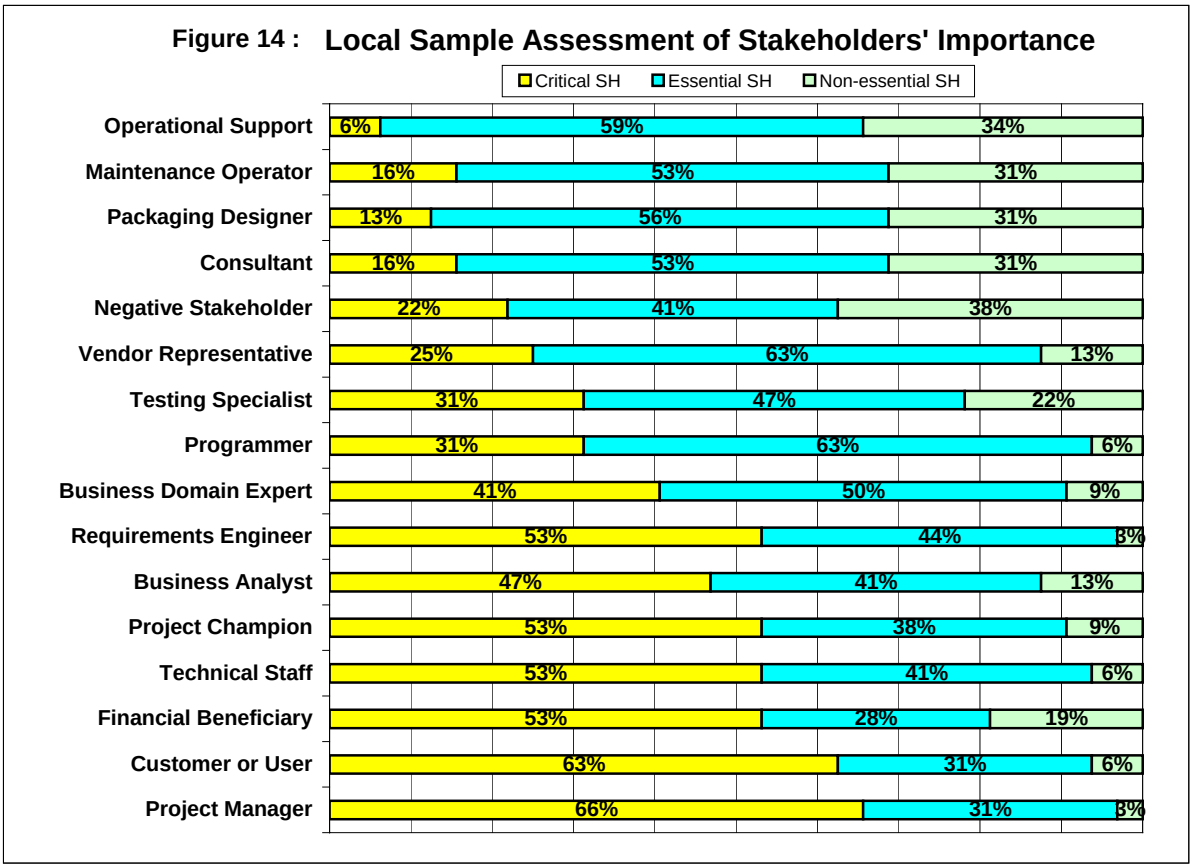


Figure 14 : Local Sample Assessment of Stakeholders' Importance



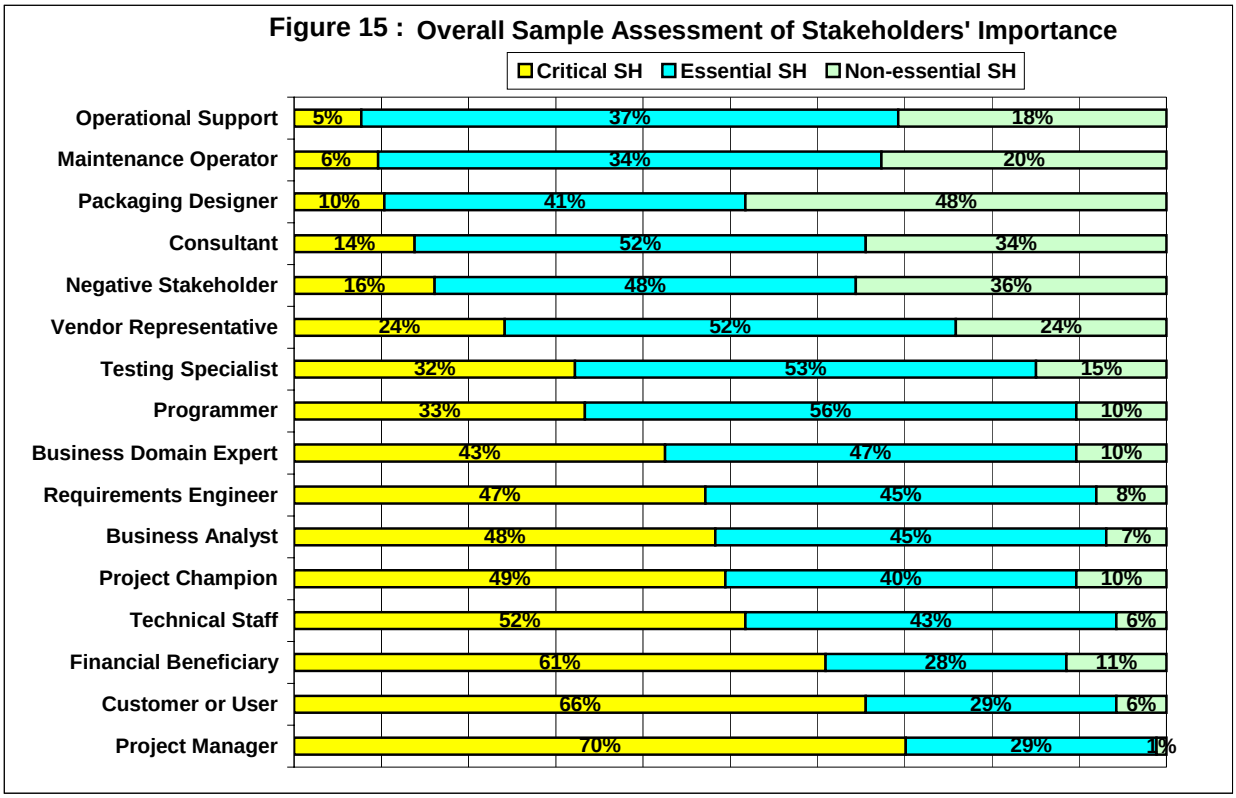


Figure 15 : Overall Sample Assessment of Stakeholders' Importance
Critical SH
Essential SH
Non-essential SH
Operational Support 5% 37% 18%
Maintenance Operator 6% 34% 20%
Packaging Designer 10% 41% 48%
Consultant 14% 52% 34%
Negative Stakeholder 16% 48% 36%
Vendor Representative 24% 52% 24%
Testing Specialist 32% 53% 15%
Programmer 33% 56% 10%
Business Domain Expert 43% 47% 10%
Requirements Engineer 47% 45% 8%
Business Analyst 48% 45% 7%
Project Champion 49% 40% 10%
Technical Staff 52% 43% 6%
Financial Beneficiary 61% 28% 11%
Customer or User 66% 29% 6%
Project Manager 70% 29% 1%

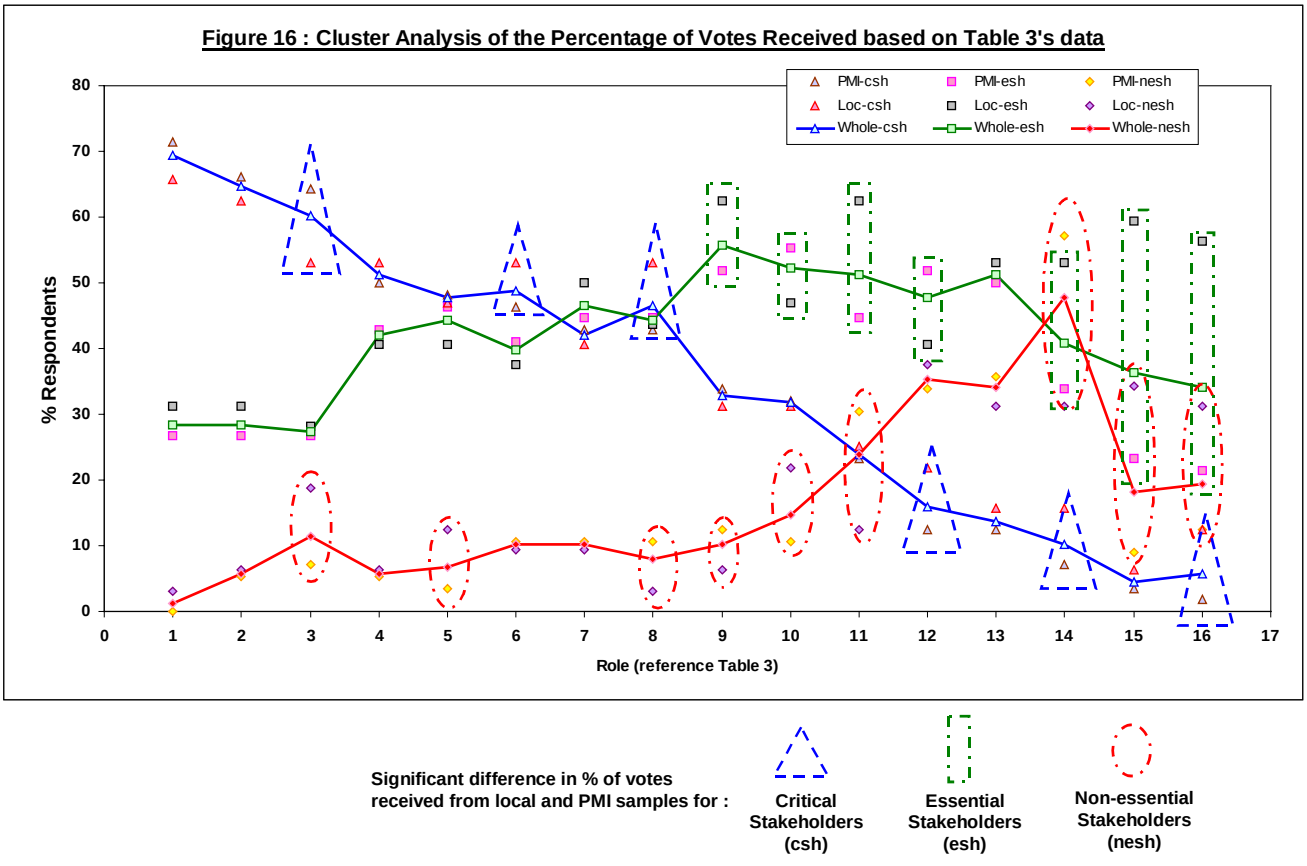


Figure 16 : Cluster Analysis of the Percentage of Votes Received based on Table 3's data
PMI-csh
PMI-esh
PMI-nesh
Loc-csh
Loc-esh
Loc-nesh
Whole-csh
Whole-esh
Whole-nesh
% Respondents
Role (reference Table 3)
Significant difference in % of votes received from local and PMI samples for :
Critical Stakeholders (csh)
Essential Stakeholders (esh)
Non-essential Stakeholders (nesh)

Table 3 : Rating (critical, essential or non-essential) of the different Stakeholder Roles

	Role	Percentage of Votes Received									PMI-Local % votes difference			Ranking of Each Role By Sample									Difference in Ranking between different Samples								
		PMI Sample			Local Sample			Overall Sample						PMI Sample			Local Sample			Whole Sample			PMI-LOC	PMI-All	Local-All	PMI-LOC	PMI-All	Local-All	PMI-LOC	PMI-All	Local-All
		csh	esh	nesh	csh	esh	nesh	csh	esh	nesh	csh	esh	nesh	csh	esh	nesh	csh	esh	nesh	csh	esh	nesh									
1	Project Manager	71.4	28.8	0.0	65.6	31.3	3.1	69.3	28.4	1.1	5.8	-4.5	-3.1	1	12	16	1	14	16	1	14	16	0	0	0	-2	-2	0	0	0	0
2	Customer/ User	66.1	28.8	5.4	62.5	31.3	6.3	64.8	28.4	5.7	3.6	-4.5	-0.9	2	13	14	2	15	14	2	15	15	0	0	0	-2	-2	0	0	-1	-1
3	Financial Beneficiary	64.3	28.8	7.1	53.1	28.1	18.8	60.2	27.3	11.4	11.2	-1.3	-11.6	3	14	12	5	16	7	3	16	8	-2	2	2	-2	-2	0	5	4	-1
4	Tech Designer, Systems or Org'l Architect	50.0	42.9	5.4	53.1	40.6	6.3	51.1	42.0	5.7	-3.1	2.2	-0.9	4	9	13	6	10	13	4	9	14	-2	2	2	-1	0	1	0	-1	-1
5	Business Analyst	48.2	46.4	3.6	46.9	40.6	12.5	47.7	44.3	6.8	1.3	5.8	-8.9	5	5	15	7	11	9	6	7	13	-2	1	1	-6	-2	4	6	2	-4
6	Project Champion	46.4	41.1	10.7	53.1	37.5	9.4	48.9	39.8	10.2	-6.7	3.6	1.3	6	10	10	4	13	11	5	11	11	2	-1	-1	-3	-1	2	-1	-1	0
7	Business Domain Expert	42.9	44.6	10.7	40.6	50.0	9.4	42.0	46.6	10.2	2.2	-5.4	1.3	8	7	9	8	7	10	8	6	10	0	0	0	0	1	1	-1	-1	0
8	Requirements Engineer	42.9	44.6	10.7	53.1	43.8	3.1	46.6	44.3	8.0	-10.3	0.9	7.6	7	6	8	3	9	15	7	8	12	4	-4	-4	-3	-2	1	-7	-4	3
9	Programmer	33.9	51.8	12.5	31.3	62.5	6.3	33.0	55.7	10.2	2.7	-10.7	6.3	9	2	5	9	1	12	9	1	9	0	0	0	1	1	0	-7	-4	3
10	Testing Specialist	32.1	55.4	10.7	31.3	46.9	21.9	31.8	52.3	14.8	0.9	8.5	-11.2	10	1	7	10	8	6	10	2	7	0	0	0	-7	-1	6	1	0	-1
11	Vendor Representative	23.2	44.6	30.4	25.0	62.5	12.5	23.9	51.1	23.9	-1.8	-17.9	17.9	11	8	4	11	2	8	11	3	4	0	0	0	6	5	-1	-4	0	4
12	Negative Stakeholder	12.5	51.8	33.9	21.9	40.6	37.5	15.9	47.7	35.2	-9.4	11.2	-3.6	12	3	3	12	12	1	12	5	2	0	0	0	-9	-2	7	2	1	-1
13	Consultant	12.5	50.0	35.7	15.6	53.1	31.3	13.6	51.1	34.1	-3.1	-3.1	4.5	13	4	2	14	6	5	13	4	3	-1	1	1	-2	0	2	-3	-1	2
14	Packaging Designer	7.1	33.9	57.1	15.6	53.1	31.3	10.2	40.9	47.7	-8.5	-19.2	25.9	14	11	1	13	5	4	14	10	1	1	-1	-1	6	1	-5	-3	0	3
15	Operational Support	3.6	23.2	8.9	6.3	59.4	34.4	4.5	36.4	18.2	-2.7	-36.2	-25.4	15	15	11	16	3	2	16	12	6	-1	0	0	12	3	-9	9	5	-4
16	Maintenance Operator	1.8	21.4	12.5	12.5	56.3	31.3	5.7	34.1	19.3	-10.7	-34.8	-18.8	16	16	6	15	4	3	15	13	5	1	0	0	12	3	-9	3	1	-2
	% Aligned																						69	81	81	19	44	50	37.5	69	56.25

Legend

csh : Critical stakeholder; esh : Essential stakeholder ; nesh : Non-essential stakeholder

Total 16 roles

Mandatory-Optional Nature of SRS Sections

In the final section of the survey, the opinions of the respondents on whether different sections or contents of the SRS should be distributed to the critical, essential and non-essential stakeholders were collected. A detailed analysis to determine whether their feedback is aligned with their opinion on the distribution of the SRS (in full or customized) to all or some of the stakeholders was also conducted. Table 4 summarizes these findings. The highlighted cells reflect a support level of at least 50% or at least half of the respondents, a tendency distinctly observed only in the local sample.

Evidently, the PMI sample shows a weak support for the distribution of the various SRS sections to all the different types of stakeholders. This comes as a surprise since the earlier feedback reflected a strong support for all the different sections of the SRS to be distributed to all the different stakeholders. The level of support for all the different sections by this group ranges from 1.8% to 33.9%.

Comparatively, the local sample is more supportive of customized SRS. The level ranges from 3.1% to 81.3% for different SRS sections to be distributed to the different classes of stakeholders, namely critical, essential and non-essential stakeholders. Accordingly, the level of support for the integrated sample is held at 3.4% to 45.5%.

It is also observable that none of the SRS sections receive more than 40% of votes (integrated sample) for all the three categories of stakeholders, thus it may be deduced that none of the SRS sections are deemed compulsory that should be distributed to all the different stakeholders.

Secondly, if the percentage of votes for each classification of stakeholders is transposed into an ordinal scale of relevance (Figure 17), it may be concluded that :

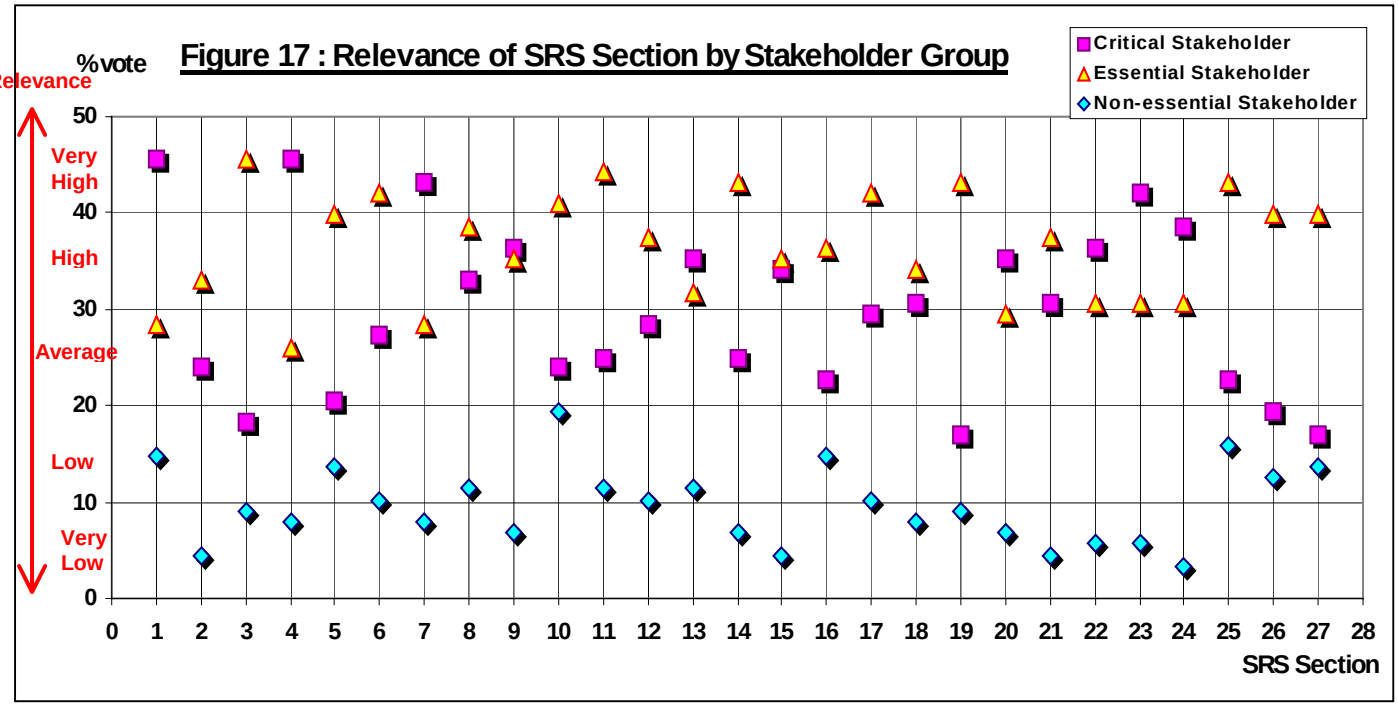
- All the 27 SRS sections have either low or very little relevance to the non-essential stakeholders
- All the SRS sections are at least highly relevant to the essential stakeholders except :
    - Section 1 : project purpose
    - Section 4 : mandated constraints
    - Section 7 : scope of work
    - Section 20 : new problems arising from this new product

  that are of average relevance. This phenomenon is acceptable in view that the essential stakeholders comprise mainly the technical staff (point 7 in page 19 of this report) involved in the development stages after the initiation stage.

Table 4 : Percentage of respondents supporting the distribution of the various SRS Section to different categories of stakeholders (critical, essential or non-essential)

SRS Section	Contents	Stakeholder (C: Critical, E : Essential, NE : Non-Essential)	Level of support for distributing the various SRS sections		
			Local Sample %	PMI Sample %	Integrated Sample %
A. Project Drivers Sections	1. Project purpose	• C	65.6	***33.9***	***45.5***
		• E	56.3	12.5	28.4
		• NE	25.0	8.9	14.8
	2. Clients, customers and stakeholders' information	• C	40.6	14.3	23.9
		• E	56.3	19.6	33.0
		• NE	***3.1***	5.4	4.5
	3. Product users information	• C	28.1	12.5	18.2
		• E	75.0	28.6	***45.5***
		• NE	18.8	3.6	9.1
B. Project Constraints Sections	4. Mandated constraints	• C	78.1	26.8	***45.5***
		• E	37.5	19.6	26.1
		• NE	15.6	3.6	8.0
	5. Naming conventions & definitions of all terms used in the project	• C	31.3	14.3	20.5
		• E	68.8	23.2	39.8
		• NE	18.8	10.7	13.6
	6. External factors and assumptions that influences the product	• C	40.6	19.6	27.3
		• E	71.9	25.0	42.0
		• NE	18.8	5.4	10.2
C. Functional Require-ments Sections	7. Scope of work	• C	65.6	30.4	43.2
		• E	53.1	14.3	28.4
		• NE	18.8	***1.8***	8.0
	8. Product scope	• C	50.0	23.2	33.0
		• E	68.8	21.4	38.6
		• NE	25.0	3.6	11.4
	9. Functional & Data Requirements	• C	62.5	21.4	36.4
		• E	56.3	23.2	35.2
		• NE	15.6	***1.8***	6.8
D. Non-Functional Require-ments Sections	10. Look & Feel Requirements	• C	43.8	12.5	23.9
		• E	59.4	30.4	40.9
		• NE	43.8	5.4	19.3
	11. Usability & Humanity	• C	46.9	12.5	25.0
		• E	68.8	30.4	44.3
		• NE	21.9	5.4	11.4
	12. Performance Requirements	• C	56.3	12.5	28.4
		• E	59.4	25.0	37.5
		• NE	15.6	7.1	10.2
	13. Operational Requirements	• C	65.6	17.9	35.2
		• E	50.0	21.4	31.8
		• NE	18.8	7.1	11.4

SRS Section	Contents	Stakeholder (C: Critical, E : Essential, NE : Non-Essential)	Level of support for distributing the various SRS sections		
			Local Sample %	PMI Sample %	Integrated Sample %
	14. Maintainability & Support Requirements	• C	37.5	17.9	25.0
		• E	***81.3***	21.4	43.2
		• NE	6.3	7.1	6.8
	15. Security Requirements	• C	62.5	17.9	34.1
		• E	50.0	26.8	35.2
		• NE	9.4	***1.8***	4.5
	16. Cultural & Political Requirements	• C	43.8	10.7	22.7
		• E	59.4	23.2	36.4
		• NE	21.9	10.7	14.8
	17. Legal Requirements	• C	56.3	14.3	29.5
		• E	65.6	28.6	42.0
		• NE	15.6	7.1	10.2
E. Project Issues Sections	18. Outstanding Issues	• C	50.0	19.6	30.7
		• E	59.4	19.6	34.1
		• NE	9.4	7.1	8.0
	19. Description of Available Off-the-shelf Solutions	• C	34.4	7.1	17.0
		• E	71.9	26.8	43.2
		• NE	9.4	8.9	9.1
	20. New Problems arising from this new product	• C	53.1	25.0	35.2
		• E	50.0	17.9	29.5
		• NE	9.4	5.4	6.8
	21. Delivery Tasks	• C	50.0	19.6	30.7
		• E	62.5	23.2	37.5
		• NE	9.4	1.8	4.5
	22. Cutover Requirements	• C	59.4	23.2	36.4
		• E	53.1	17.9	30.7
		• NE	9.4	3.6	5.7
	23. Risks	• C	68.8	26.8	42.0
		• E	50.0	19.6	30.7
		• NE	9.4	3.6	5.7
	24. Costs	• C	65.6	23.2	38.6
		• E	50.0	19.6	30.7
		• NE	***3.1***	3.6	***3.4***
	25. User Documentation & Training	• C	34.4	16.1	22.7
		• E	71.9	26.8	43.2
		• NE	31.3	7.1	15.9
	26. Pending requirements	• C	28.1	14.3	19.3
		• E	68.8	23.2	39.8
		• NE	21.9	7.1	12.5
	27. Ideas for Solutions	• C	28.1	10.7	17.0
		• E	68.8	23.2	39.8
		• NE	18.8	10.7	13.6
	KEY	≥ 50	40-49.9	30-39.9	20-29.9



Consequently, it is expected that these sections are at least highly relevant to the critical stakeholders, which include mainly technical staff involved at the initiation stage of the project and the important business or non-technical user groups.

Thirdly, it is possible to categorize the various SRS sections by relevance for the different groups of stakeholders. For instance :

- SRS section 1, Project purpose can be considered compulsory for the critical stakeholders, optional for the essential stakeholders and irrelevant to the non-essential stakeholders
- SRS section 3, Product users information is applicable to the essential stakeholders but optional for the critical and non-essential stakeholders.

A couple of respondents also shared that when they distributed their SRS by specified criteria there was an “increase in ACTIVE reading and correct sign-off of documentation from the stakeholders”. They also believed that the stakeholders were more focused and not distracted by irrelevant or non-essential sections, which has in turn raised productivity and improved the efficiency of the requirements validation phase and the detection of flaws as the stakeholders.

Others felt that the customization of SRS is circumstantial and should be decided on a case-by-case basis (project based) :

- They agree that customized SRS have both merits and demerits. Customized SRS may help the stakeholders to concentrate on what they need to know, thus reducing the time and effort in understanding the requirements; they give rise to the challenge of deciding who should know what which involves another set of risks.
- A project involves technical and non-technical stakeholders. The non-technical stakeholders may include business partners who want to keep a low profile or remain as dormant sponsors and stakeholders who are directly involved in the business' revenue-generation functions who want to steer clear of unnecessary technicalities or matters that are not directly related to them. Hence these stakeholders would prefer a set of high-level key requirements without any technical details. However, the entire development (technical) team should be given the entire set of SRS.
- Another group of respondents felt that SRS can be distributed by the level of abstraction or detail of system requirements. For instance high-level system requirements (or summary of requirements), which would generically apply to all the different stakeholders, should be distributed to everyone for awareness and better understanding of the project context as well as requirements validation purposes; while the detailed requirements should be distributed based on stakeholders' interests or needs or roles.

Other distribution criteria :

- "The politics of individual organizations always come into play", it may be necessary to distribute the SRS according to an organization's policies.
- Stakeholders' engagement or motivation and their position as informal leaders (as opposed to formal leaders presented in the organization chart)
- Size and Complexity of the project besides the impact of the project for instance the number of different business domains involved or number of existing applications that needs to be integrated
- Based on a multitude of factors such as the role, importance and status (internal or external to the organization) should be used.

Table 5 : Comparison of Views on the distribution of SRS by different samples

Sample	Practiced distributing the full SRS to all stakeholders	Feel that the SRS should be distributed in full	Practiced the distribution of customized SRS	Support the idea of distributing the SRS by some criteria to various stakeholders	Level of support for each SRS section to the three types of stakeholders
Local	25.0%	6.3%	46.9%	84.4%	3.1% to 81.3%
PMI	53.6%	64.3%	32.1%	35.7%	1.8% to 34%
Integrated	43.2%	43.2%	53.4%	53.4%	3.4% to 45.5%

Amongst all those who felt that the complete SRS should be distributed to all the stakeholders, only one respondent consistently voted for all the sections to be distributed to all the stakeholders. 38 or 74.5% of this group of respondents did not provide any feedback on the sections to be distributed to the various groups of stakeholders.

All those who had supported the idea of distributing various SRS sections by some criteria provided their feedback on the sections that should be distributed to each group of stakeholders.

A few of the respondents were neutral as to whether the SRS should be distributed in full or by some criteria to the different types of stakeholders but provided their opinion on which SRS sections they felt should be distributed to which group of stakeholders.

Overall only 14% of the respondents showed some support in the distribution of some sections of the SRS to the non-essential stakeholders.

Other feedback that were gathered :

- Currently, most project managers rely on electronic spreadsheets and word processing software to document their systems requirements, which are ineffective for requirements tracking and management, this translates into an “educational opportunity” for project managers to learn Requirements Management as part of Project Management training.
- SRS should be given some flexibility and not be rigidly based on some standard or method which may lead to unproductive efforts to generate the voluminous set of documentation that is not aligned with the project’s characteristics :
    1. SRS should be created at the appropriate documentation level (language, terminology and methods)

2. All projects are different and would use different development approaches, the choice of SRS layout should be aligned to the officially adopted development approach

- SRS should be specific as it reflects the agreement between the customer and the vendor in terms of what the system is expected to perform.
- SRS should be prepared with at least two levels of abstraction prepared as separate sub-documents :

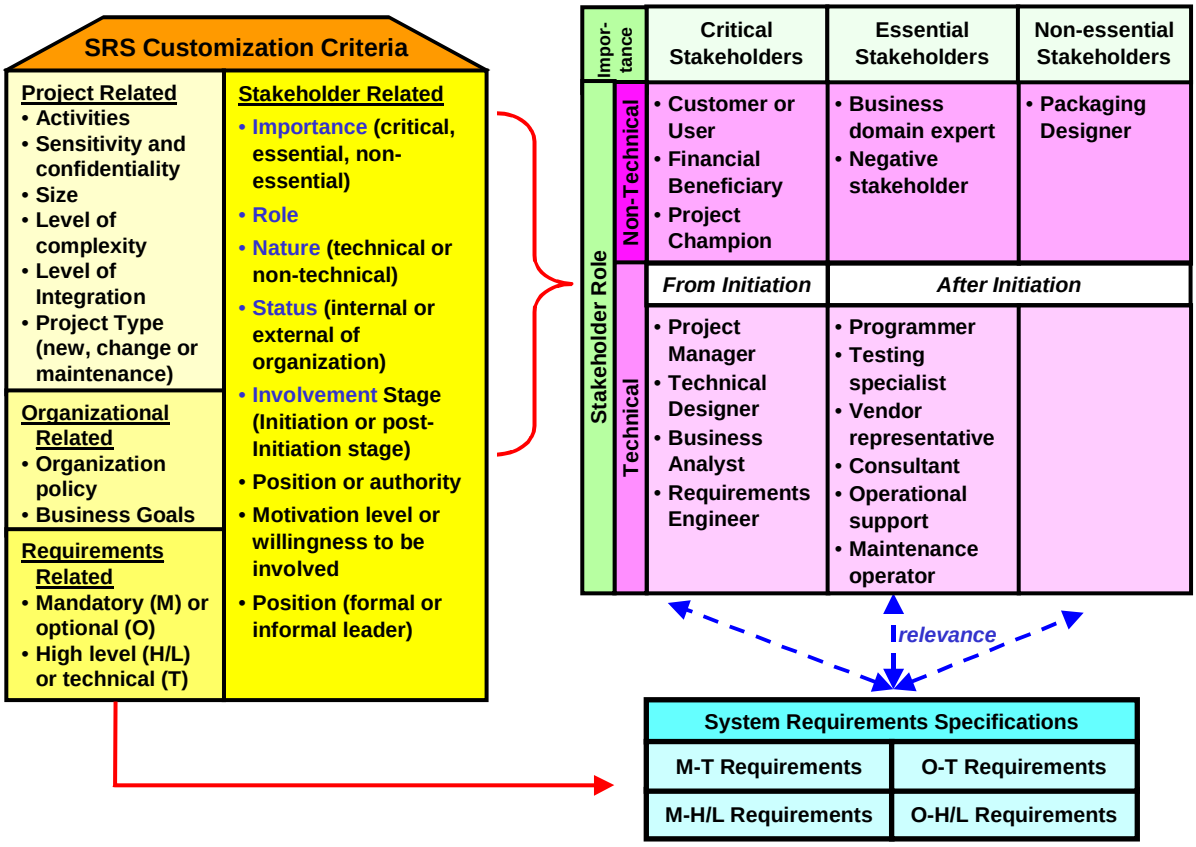
    1. General level that comprise all the key functional requirements free of technical requirements
    2. Detailed level which covers technical and performance requirements, including maintenance, budgets, risks, constraints, unresolved problems or documentation

    Consequently, the general level SRS would become compulsory and distributed in full to all the stakeholders, while the detailed level SRS serve as a complementary document (comprising optional sections) that can be customized on need or other criteria basis for affected stakeholders only.

Conclusion

The SRS customization criteria may be classified into four key categories as represented in the following diagram :

Figure 18 : SRS Customization Framework



- **Project related criteria** that are basically dependent on the project characteristics such as project activity that is dependent on the product life cycle, the sensitivity and confidentiality of the project, the project size (large, medium or small), the level of complexity (simple, average or highly complex), the level of integration (the number of business domains, number of existing application systems, number of inter-organizational systems), and the project type (new product development, change management or maintenance related projects).
- **Organizational related criteria** that is reliant on the organization's communication policy and business goals that the project is related to.

- **System Requirements related criteria** where the requirements may be further classified into ‘Mandatory High-Level’, ‘Mandatory-Technical’, ‘Optional High-Level’ and ‘Optional-Technical’. The set of requirements that fall into each of these baskets in turn is dependent on the type of stakeholders that are concerned, which is critical, essential or non-essential.
- **Stakeholder related criteria** which is directly associated with the stakeholder. These include the importance of the stakeholder to the project (critical, essential or non-essential), the role that the stakeholder is undertaking (total of 16 roles covered in this research), the nature of work that the stakeholder is involved with (technical or non-technical) from the project’s perspective, whether the stakeholder is internal or external of the organization, the stakeholder’s point of involvement from the product development life cycle perspective (from Initiation phase or Post-Initiation stages), the stakeholder’s position or level of authority, the level of motivation for the concerned project and whether the stakeholder is a formal or informal leader in the project.

In closing, the distribution of customized SRS is not a new idea. Its acceptance and adoption rates are growing although the pace is rather slow presently. However, there is a great potential for it to become the next wave of common practice as projects grow in complexity, size, level of integration and involvement besides the enlargement of project stakeholders involved facilitated by technology.

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