Annexure I – Supply Chain Definitions

As defined by The Supply Chain Council (2002), a supply chain encompasses every effort involved in producing and delivering a final product from the supplier’s supplier to the customer’s customer.

Supply chain encompasses all activities involved in the transformation of goods from the raw material stage to the final stage, when the goods and services reach the end customer (Shah, Janat, 2009).

A Supply Chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and distribution of these finished products to customers (Kachru, U., 2014).

A Supply Chain encompasses all activities in fulfilling customer demands and requests. These activities are associated with the flow and transformation of goods from the raw materials stage, through to the end user, as well as the associated information and fund flows. (Li, Lung, 2011).

The chain of all processes and organizations that are involved in making a product available to customers is called a supply chain. (Kotzab, H., & Sinha, A., 2012).

A supply chain is the link connecting a set of facilities, companies, demand and supply points and service providers. This chain links the upstream suppliers and downstream customers with the flows of products, services, finances and information from a source to a customer. (Sople, V., 2012).

A supply chain includes the chain of entities involved in the planning, procurement, and production and distribution of products and services (Mahadevan, B., 2010).

Supply Chain is defined as "A set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system wide costs while satisfying service level requirements" (Simchi-Levi, D et al., 2008).
The supply chain network includes upstream, downstream and lateral suppliers producing goods, services or other value adding activities. (V.M. Rao Tummala et al., 2006)

A supply chain consists of all stages involved, directly or indirectly, in fulfilling a customer request. The supply chain not only includes the manufacturer and suppliers, but also transporters, warehouses, retailers and customers themselves. (Chopra, S. and Meindl, P., 2007).

Supply chains can be considered as a network of independent and autonomous entities that work in unison towards some common objective (Saetta, S. et al., 2012)

Supply chains are value-adding relations of partially discrete, yet inter-reliant, units that cooperatively transform raw materials into finished products through sequential, parallel, and/or network structures (Bowersox DJ et al., 2012)

A supply chain is that network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer or consumer (Rogers, D.S. and Tibben-Lembke, R., quoted in Lysons, K. and Farrington, B., 2010)

A network of connected and independent organizations mutually and cooperatively working together to control, manage and improve the flow of materials and information from suppliers to end users (Aitken J., quoted in Christopher, M., 2011)

SC is a collection of functional activities (transportation, inventory control etc.), which are repeated many times throughout the channel through which raw materials are converted into finished products and consumer value is added. (Ballou, R.H. & Srivastava, S.K., 2007)

Series of companies that eventually make products and services available to consumers, including all of the functions enabling the production, delivery and recycling of materials, components, end products and services, is called as a supply chain. (Wisner, J., D. et al., 2008)
A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products and the distribution of these finished products to customers. (Mohanty, R., & Deshmukh, S.G., 2005).
Annexure II – Supply Chain Management Definitions

Increasingly, the management of multiple relationships across the supply chain is being referred to as supply chain management (SCM). (Lambert, D.M. et al. 2000)

Supply Chain Management was a phrase first coined in the early 1980s to describe the range of activities coordinated by an organization to procure and manage supplies (Oliver, R.K. and Webber, M.D., quoted in Hines, Tony, Supply Chain Strategies, 2008)

Supply Chain Management involves planning, design and control of flow of material, information and finance along the supply chain to deliver superior value to the end customer in an effective and efficient manner (Shah, Janat, 2009)

Supply Chain Management can be defined as the active management of supply chain activities to maximize customer value and achieve a sustainable competitive advantage. It represents conscious effort by the supply chain firms to develop and run supply chains in the most effective and efficient ways possible (Kachru, U., 2014)

Supply Chain Management is a set of synchronized decisions and activities utilized to efficiently integrate suppliers, manufacturers, warehouses, transporters, retailers and customers so that the right product or service is distributed at the right quantities, to the right locations, and at the right time, in order to minimize system wide costs while satisfying customer service level requirements. The objective of Supply Chain Management is to achieve sustainable competitive advantage (Li, Lung, 2011)

The management of supply chains, its design, process execution and control is called supply chain management (Kotzb, H., & Sinha,A., 2012)

Supply Chain Management is the systematic and strategic coordination of all business functions within a company and across businesses within the supply chain to improve long term performance of individual companies and the supply chain as a whole.(Sople,V., 2012)

As per Council of Supply Chain Management Professionals (CSCMP), Supply chain management encompasses the planning & management of all activities involved in
sourcing and procurement, conversion and all logistics activities. It also includes coordination and collaboration with channel partners which can be suppliers, intermediaries, third party service providers & most importantly customers. In essence SCM integrates supply and demand management within and across companies. (CSCMP, 2003)

Supply chain management encompasses materials/supply management from the supply of basic raw materials to final product (and possible recycling and re-use). Supply chain management focuses on how firms utilize their suppliers' processes, technology and capability to enhance competitive advantage. It is a management philosophy that extends traditional intra-enterprise activities by bringing trading partners together with the common goal of optimization and efficiency (Tan, K.C. et al., 1998)

Supply chain management aims at building trust, exchanging information on market needs, developing new products, and reducing the supplier base to a particular OEM (original equipment manufacturer) so as to release management resources for developing meaningful, long term relationship (Berry et al., 1994)

External Chain is the total chain of exchange from original source of raw material, through the various firms involved in extracting and processing raw materials, manufacturing, assembling, distributing and retailing to ultimate end customers. (Saunders, M.J., 1995)

A network of firms interacting to deliver product or service to the end customer, linking flows from raw material supply to final delivery (Ellram, L.M., 1991)

Network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumer. (Christopher, M., 1992)

Networks of manufacturing and distribution sites that procure raw materials, transform them into intermediate and finished products, and distribute the finished products to customers. (Lee, H.L. & Billington, C., 1992)

Supply chain management is the integration of all activities associated with the flow and transformation of goods from new materials, through to the end user, as well as associated
information flows, through improved supply chain relationships to achieve a sustainable competitive advantage (Handfield, R. B. & Nichols, E.L., 1999)

The new vision of supply chain management links all the players and activities involved in converting raw materials into products and delivering those products to consumers at the right time and at the right place in the most efficient manner. (William C. Copacino, 1997)

Systematic effort to provide integrated management to the Supply Value Chain in order to meet customer needs and expectations, from suppliers of raw materials through manufacturing and on to end customers.(Stein, Martin and Voehl, Frank, 1998)

Supply Chain Management is the integration of business processes from end user through original suppliers that provides products, services, and information that add value for customers. Supply chain management is not just another name for logistics. It includes elements that are not typically included in a definition of logistics, such as information systems integration and coordination of planning and control activities. (Cooper et al., 1997)

Supply chain management is the coordination of activities, within and between vertically linked firms, for the purpose of serving end customers at a profit.( Paul D. Larson and Dale S. Rogers, 1998)

The challenge of coordinating operations across all facets of a business has become known as supply chain management (SCM). (Stank et al., 2001)

Supply chain management (SCM) is aimed at harmonizing the interaction and ensuring the integration between partners of logistics chains in order to increase the overall outcome. (Bullinger et al., 2002)

Supply chain management is the integration of key business processes among a network of interdependent suppliers, manufacturers, distribution centers, and retailers in order to improve the flow of goods, services, and information from original suppliers to final customers, with the objectives of reducing system-wide costs while maintaining required service levels (Christopher, Martin, 1998), New, Stephen and Philip Payne, 1995)
Supply chain management is defined as the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole (Mentzer et al., 2001)

Supply Chain Management (SCM) is all the overt management actions undertaken to realize the SCM philosophy across the firms within the supply chain. (Min et al., 2004)

Supply chain management constitutes all activities associated with design, planning, synthesis, organization, and control of supply chains. (Chan et al., 2003)

SCM is the oversight of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer. (Robertson et al., 2002)

Supply chain management is the management of material and information flows both in and between facilities, such as vendors, manufacturing and assembly plants and distribution centers (DC). (Douglas et al., 1996)

The set of entities, including suppliers, logistics services providers, manufacturers, distributors and resellers, through which materials, products and information flow. (Kopczak, L.R., 1997)

SCM is defined as the systemic, strategic coordination of the traditional business functions within a particular organization and across businesses within supply chain, with the aim of improving the performance of both the companies as well as the whole supply chain (Chong et al., 2011)

Supply chain management seeks improved performance through better use of internal and external capabilities in order to create a seamlessly coordinated supply chain, thus elevating inter-company competition to inter-supply chain competition. (Anderson et al. 1998, Morgan et al., 1996)
Council of Logistics Management (CLM) [5] defines SCM as the systemic, strategic coordination of the traditional business functions and tactics across these businesses functions within a particular organization and across businesses within the supply chain for the purposes of improving the long-term performance of the individual organizations and the supply chain as a whole. (Council of Logistics Management. What it's all about. Oak Brook: CLM, 2000)

Supply Chain Management is defined as the systematic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long term performance of individual companies and the supply chain as a whole. (Mentzer et al. 2001)

ISM describes SCM as ‘the design and measurement of seamless, value added processes across organizational boundaries to meet the real needs of the end customer. The development and integration of people and technology resources are critical to successful supply chain integration’. The Institute of Supply Management, as quoted in Wisner, J., D. et al., 2008)

Supply Chain Council (SCC) defines supply chain management as ‘managing supply and demand, sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, and delivery to the customer’. (SCC)

Supply chain management can be defined as the integration activities taking place among a network of facilities that procure raw materials, transform them into intermediate goods and then final products, and deliver products to customers through a distribution system. (Lee et al. 1995)

SCM is the strategic management of all the traditional business functions that are involved in any flows, upstream or downstream, across any aspect of the supply chain system. (Mentzer, J.T., 2007)
Thus, SCM viewed broadly, integrates a number of key functions, including purchasing, demand management, distribution planning, quality management, manufacturing planning, and materials management throughout the supply chain (Narasimhan, Ram et.al.2006).

One common theme in the literature is that SCM, in its basic form, proactively plans and coordinates the flow of products, services, and information among a connected series of firms that range from final customers to raw material providers. These firms are focused on creating and delivering value in the form of both finished products and services to end-customers (Scannell, T. et al. 2000)
Annexure III – Covering Email & Survey Instrument

Respected Sir,

Greetings! Your reference was given by …… Sir.

I am Ajay Parulekar, currently working as a faculty in Supply Chain & Operations Management at Vishwakarma Institute, Pune. I am basically a Mechanical Engineer with MBA in materials & systems from SIBM (Gold Medalist). Prior to academics I have worked in industry in Supply Chain domain for about 12 years. Currently I am pursuing my Ph.D. in SCM from Pune University (SSPU).

As a part of my Ph.D., I am conducting a survey to understand the importance of Mckinsey's 7 S's (strategy, structure, systems, skills, staff, leadership style & shared values) in supply chain performance and impact of supply chain performance on organizational performance. In this regard I have formulated a questionnaire containing a list of statements which will help me measure these constructs. At this juncture I need your help in filling out the questionnaire which tries to measure supply chain performance in terms of Mckinsey's 7 Ss. I can record your responses in person / through telecom or can mail the questionnaire as per your convenience.

Needless to mention all the responses as well as name / details about the company you represent shall be kept strictly confidential and the responses shall only be used for academic research purpose only.

Your help shall be invaluable in terms of understanding SCM performance in the context of Indian manufacturing industry. Awaiting your response,

Thanks,

With Best Regards,
Ajay Parulekar
Mob # 8983525998
SURVEY INSTRUMENT

An analytical study of Supply Chain performance and its comparison with total performance for select manufacturing organizations in Pune industrial belt with reference to Mckinsey 7 S framework.

General Information

Name –

Educational Qualification –

Designation –

Organization Name –

Organization Sales / Turnover for latest FY (choose whichever is applicable)

  i) Less than INR 500 Cr.
  ii) More than INR 500 Cr. but less than INR 1000 Cr.
  iii) More than INR 1000 Cr. but less than INR 1500 Cr.
  iv) More than INR 1500 Cr. but less than INR 2000 Cr.
  v) More than INR 2000 Cr. but less than INR 2500 Cr.
  vi) More than INR 2500 Cr.

Does the Organization has a separate SCM department? (Y / N)

Who is the highest authority responsible for supply chain decisions in your organization?

What % of your input (with total input cost as a base) is imported?

What % of your output (with total sales value as a base) is exported?

Are you aware about Mckinsey's 7 S framework? (Y / N)

1. Rank the following in terms of their importance to your organization,
   i) Strategy
   ii) Structure
iii) Systems
iv) Staff
v) Skills
vi) Style
vii) Shared Value

SI: The positioning and actions taken by an enterprise, in response to or anticipation of changes in the external environment, intended to achieve competitive advantage

To what extent you agree / disagree with following statements,

(1 – Strongly Disagree, 2 – Disagree, 3 – Somewhat Disagree, 4 – Undecided, 5 – Somewhat Agree, 6 – Agree, 7 – Strongly Agree)

2. SC efforts play an important role in reducing costs across the supply chain
3. SC efforts play an important role in reducing response times across the supply chain
4. SC efforts play an important role in improving the integration of activities across the supply chain
5. SC efforts play an important role in communicating our Organization's future strategic needs to suppliers (material / service)
6. SC efforts play an important role in contacting our supply chains' end users to get product and customer service feedback

7. Rank the following in terms of their strategic importance to your organization,

i) Profitability
ii) Cost reduction
iii) Market Share
iv) New Market entry
v) New product launch
vi) Customer Satisfaction
vii) Others (Please specify)
S2: The way in which tasks and people are specialized and divided, and authority is distributed; how activities and reporting relationships are grouped; the mechanisms by which activities in the organization are coordinated

To what extent you agree / disagree with following statements (8 – 14),

(1 – Strongly Disagree, 2 – Disagree, 3 – Somewhat Disagree, 4 – Undecided, 5 – Somewhat Agree, 6 – Agree, 7 – Strongly Agree)

8. SC structure facilitates ease of sharing of information within and across supply chain members
9. SC structure inhibits speedy resolution to supplier (material / service) query
10. SC structure facilitates speedy resolution to customer query
11. SC structure inhibits flexibility in responding to changes in supply chain
12. SC structure facilitates ease of employee feedback for improvement in SCM operations
13. SC structure inhibits swift decision making in day today SCM operations
14. SC structure facilitates exercising effective control over supply chain members

15. What is the current supply chain structure type? (Tall / Flat)

16. What is the length of your supply chain? (In the context of this survey, you may assume length as number of different entities involved in the supply chain say supplier (material / service) s, transporters, w/h agents, distributors, retailers etc. including yourself)

i) Less than 5     ii) More than or equal to 5 but less than 10     iii) More than or equal to 10 but less than 15     iv) More than or equal to 15 but less than 20     v) More than 20

S3: The formal and informal procedures used to manage the organization, including management control systems, performance measurement and reward systems, planning, budgeting and and resource allocation systems and management information systems
17. Which of the following systems does the organization currently use? (select all that applies)


To what extent you agree / disagree with following statements (18 – 15),

(1 – Strongly Disagree, 2 – Disagree, 3 – Somewhat Disagree, 4 – Undecided, 5 – Somewhat Agree, 6 – Agree, 7 – Strongly Agree)

18. Our organization has an extremely effective process of performance appraisal for the SC staff
19. Our organization has an extremely effective process of performance appraisal for the SC partners
20. Our organization has a robust Demand Forecasting and Planning system
21. Our organization has a effective Supplier (material / service) Evaluation and Rating system
22. Our organization has a effective Distributor selection and Appointment system
23. Our organization has an effective Supplier (material / service) Selection and Appointment system
24. Our organization has an effective Supplier (material / service) Complaint Handling system
25. Our organization has an effective Customer complaint handling system

S4: The people, their backgrounds and competencies, how the organization recruits, selects, trains, socializes, manages their careers, and promotes employees

To what extent you agree / disagree with following statements (26 – 31),

(1 – Strongly Disagree, 2 – Disagree, 3 – Somewhat Disagree, 4 – Undecided, 5 – Somewhat Agree, 6 – Agree, 7 – Strongly Agree)

26. We have an effective recruitment process
27. We have professionally qualified SC staff
28. Supply chain staff is trained to tackle supply chain challenges effectively and efficiently
29. There are sufficient opportunities for career advancement in our SC function
30. Majority of our leaders are busy in micro managing
31. Our Organization takes efforts to expose SC staff to latest SCM tools and techniques

32. Rank the following skills for supply chain staff in terms of their importance to your organization

i) Domain Knowledge ii) Cross functional knowledge
iii) Ability to work with external agencies iv) Ability to acquire new skills
v) Getting things done vi) Relationship building
vii) Others (Please specify)

S5: The distinctive competencies of the organization; what it does best along dimensions such as people, management practices, process systems, technology, and customer relationships

To what extent you agree / disagree with following statements (33 – 37),

(1 – Strongly Disagree, 2 – Disagree, 3 – Somewhat Disagree, 4 – Undecided, 5 – Somewhat Agree, 6 – Agree, 7 – Strongly Agree)

33. We are a industry benchmark for supply chain processes
34. We believe that our organization is known for its supply chain capabilities
35. Our organization spends considerable resources (human, material, capital and information) in continuously enhancing its supply chain
36. Performance of our supply chain from customers' perspective can be rated as extremely satisfactory
37. In comparison to our key competitors, our supply chain skills are extremely superior
38. Your customers know your organization for (select whichever applies)

Delivers as promised

Is flexible

Best value for money

Product innovations

Long term relationships

Others (please specify)

S6: The leadership style of managers - how they spent their time, what they focus attention on, what questions they ask of employees; how they make decisions; also the dominant values, beliefs, the norms, the conscious and unconscious symbolic acts taken by leaders (job titles, dress codes, executive dining rooms, corporate jets, informal meeting with employees)

39. According to you, which characteristics are vital for supply chain leadership? (select all that applies)

i) Domain Knowledge  ii) Overall business understanding  iii) Decisiveness  iv) Flexibility  v) Team Building  vi) Vision  vii) Others (pl. specify)

To what extent you agree / disagree with following statements (40 – 46),

(1 – Strongly Disagree, 2 – Disagree, 3 – Somewhat Disagree, 4 – Undecided, 5 – Somewhat Agree, 6 – Agree, 7 – Strongly Agree)

40. Supply chain employees view organization / SCM leadership as extremely trustworthy

41. Organization / SCM leadership views coordination within the organization and across supply chain partners as extremely important

42. In our organization, Supply chain improvement suggestions from employees are always encouraged
43. Our top management regularly arranges SC partners meet to discuss future plans
44. Our leaders go out of the way and ensure personal welfare of group members
45. While taking key decisions, our organization always takes into account business
goals of its supply chain partners
46. Decision making in our organization is highly centralised

S7: The core or fundamental set of values that are widely shared in the organization
and serve as guiding principles of what is important, vision, mission and value
statements that provide a broad sense of purpose for all employees

To what extent you agree / disagree with following statements (47 – 53),
(1 – Strongly Disagree, 2 – Disagree, 3 – Somewhat Disagree, 4 – Undecided, 5 – Somewhat Agree, 6 – Agree, 7 – Strongly Agree)

47. Our SC partners are fully aware about our corporate values
48. In our organization all the employees working on a specific assignment are treated as equals
49. Long term relationship with supply chain partners is considered to be extremely important
50. We have sufficient clarity about what is expected from the SC function in terms of explicit KPIs and deliverables
51. Our organization top management cites supply chain as a key business driver
52. Our organization has perfect alignment of supply chain functional objectives with organizational vision, mission & values
53. In our organization, opinion of a subordinate is considered before the final decision is taken

54. Rank the following in terms of their importance for supply chain as a function
i) Participatory decision making ii) Clarity of objectives
iii) Alignment of objectives iv) Transparency
v) Trustworthiness vi) Others (please specify)
**S8: Supply Chain Performance**

Rate the following with reference to performance of supply chain management in your organization (55 – 61),

(1 – Never, 2 – Very Rarely, 3 – Rarely, 4 – Occasionally, 5 – Frequently, 6 – Very Frequently, 7 – Every time)

55. Our SC function ensures no upward revision in freight cost during a FY
56. Our SC function makes sure that, Inventory carrying costs (other than attributable to speculative buying), have not shown increasing trend
57. Our SC function ensures no upward revision in prices of key input materials during a FY
58. Our SC function meets the delivery dates as committed to the customers
59. Our SC function ensures timely availability of input materials as per the business plan
60. Our SC function has reduced the instances of transit material damage
61. Our SC function has consistently negotiated better credit terms with the supplier (material / service)

**S9: Organizational Performance**

Rate the following with reference to performance of supply chain management in your organization (62 – 69),

(1 – Never, 2 – Very Rarely, 3 – Rarely, 4 – Occasionally, 5 – Frequently, 6 – Very Frequently, 7 – Every time)

62. Our organization does not resort to upward revision in prices of its products during a FY
63. Our organization has not incurred any loss in market share vis-à-vis competitors
64. Our organization has managed to achieve increasing profitability vis-à-vis competitors
65. Our organization is able to respond to changes in order quantity and delivery needs of key customers
66. In our organization, the warranty / replacement costs, other than attributable to faulty in-house manufacturing, have not shown increasing trend
67. Our organization has ensured customer satisfaction by achieving timely and defect free deliveries
68. Our organization has ensured timely new product launches
69. Our organization has managed to reduce its working capital need consistently
Annexure IV – Cohen’s Kappa & Moore and Benbasat’s Hit Ratio

Q-sort is a method of assessing reliability and construct validity of questionnaire items at a pre-testing stage. It’s a qualitative method. The method uses Cohen’s Kappa (Cohen, 1960) and Moore and Benbasat’s “Hit Ratio” (Moore and Benbasat, 1991) as the two measures for its assessment.

The Q-sort method is an iterative process in which the degree of agreement between judges forms the basis of assessing construct validity and improving the reliability of the constructs. The method consists of two stages. In the first stage, two judges are requested to sort the questionnaire items according to different constructs, based on which the inter-judge agreement is measured. In the second stage, questionnaire items that were identified as being too ambiguous, as a result of the first stage, are reworded or deleted, in an effort to improve the agreement between the judges. The process is carried out repeatedly until a satisfactory level of agreement is reached.

Cohen’s Kappa as a measure of agreement can be interpreted as the proportion of joint judgement in which there is agreement after chance agreement is excluded. The three basic assumptions for this agreement coefficient are: 1) the units are independent, 2) the categories of the nominal scale are independent and mutually exclusive, and 3) the judges operate independently.

A second overall measure of both the reliability of the classification scheme and the validity of the items was developed by Moore and Benbasat (1991). The method required analysis of how many items were placed by the panel of judges for each round within the target construct. In other words, because each item was included in the pool explicitly to measure a particular underlying construct, a measurement was taken of the overall frequency with which the judges placed items within the intended theoretical construct. The higher the percentage of items placed in the target construct, the higher the degree of inter-judge agreement across the panel which must have occurred.

Scales based on categories which have a high degree of correct placement of items within them can be considered to have a high degree of construct validity, with a high potential for good reliability scores. This procedure is more a qualitative analysis than a rigorous quantitative procedure. There are no established guidelines for determining good levels of
placement, but the matrix can be used to highlight any potential problem areas. The item placement ratio (the “Hit Ratio”) is an indicator of how many items were placed in the intended, or target, category by the judges.
Annexure V – PROCESS

PROCESS, a computational procedure for SPSS and SAS that implements moderation or mediation analysis as well as their combination in an integrated conditional process model (i.e., mediated moderation and moderated mediation). Using a path analysis framework PROCESS provides many of the capabilities of existing programs and tools while expanding the number and complexity of models that combine moderation and mediation, all in a single, easy-to-use command or (for SPSS) point-and-click interface.

PROCESS estimates the coefficients of a model using OLS regression (for continuous outcomes) or maximum likelihood logistic regression (for dichotomous dependent variables). Additionally, PROCESS generates direct and indirect effects in mediation and mediated moderation models, conditional effects in moderation models, and conditional indirect effects in moderated mediation models with a single or multiple mediators. PROCESS offers various tools for probing 2 and 3 way interactions and can construct bias corrected and percentile based bootstrap confidence intervals for conditional and unconditional indirect effects in mediation models.

PROCESS is freely available and can be downloaded from http://www.afhayes.com/ along with documentation. Once the file is downloaded, opened as an SPSS syntax or SAS program file, and executed entirely, the PROCESS command is added to the SPSS or SAS command dictionary and is available for use until quitting an SPSS or SAS session. The arguments that must be provided to the PROCESS command include a list of variables in the model, a model number telling PROCESS which model it should estimate, and a set of variable definitions which inform PROCESS what role various variables play in the model (i.e., independent variable, moderator(s), mediator(s), dependent variable). Familiarity with the documentation is essential, as it contains visual representations of the models PROCESS can estimate, along with the corresponding model number, and the various options available to the analyst. The majority of the models PROCESS estimates combine moderation and mediation analysis in some form, with various paths specified as unmoderated or moderated by one or two variables. A few of the models are mediation models without moderation (either single, multiple parallel, or multiple serial), and a few are used for the analysis of moderation without a mediation component, either simple,
multiple additive, or multiple multiplicative. The model = 4 specification tells SPSS to estimate an unmoderated mediation model, with the X, M, and Y variables defined as specified in the command.

(As adapted from Hayes, A.F., 2012)