INTERPRETING THE CONCEPT OF 'VALUE' WITHIN THE LEAN PARADIGM

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1. INTRODUCTION

At ISL 2012 we presented our inaugural paper in a programme of research that sought to explore the conception, communication and execution of what is perhaps the most fundamental concept for both research and practice within our field of contemporary logistics and supply chain management (SCM); the concept of 'value' (Fisher *et al*., 2012). In that paper, we specifically explored the notion of value within the practitioner-oriented literature. At ISL 2013 we extended that study into the academic literature in the guise of a comprehensive content analysis of peer-reviewed papers on the topic of value within the leading purchasing, logistics and SCM journals (Francis *et al*., 2013; Francis *et al*., 2014), before then developing a new theoretical framework for better understanding value within our field at ISL 2014 (Fisher *et al*., 2014).

In the above body of work we found that there had been significant growth in interest on the subject of value over the last three decades, and that the concept of value is undoubtedly a cornerstone of the contemporary notion of both the production system and the supply chain. However, we also found that there is currently no coherent conception of value within either the academic or practitioner SCM literatures. These findings have very significant implications for academics in our field, as it raises the question of how it is possible to study effectively something that is [so] inadequately defined? This in turn throws into question a significant proportion of the extant research within the production and SCM fields. The above findings also have significant implications for practitioners in these fields, as it also throws into question how it is possible to design an effective or efficient production system or supply chain based upon the value [delivery] principle if none of the actors have a common understanding, let alone consensus, of what that value amounts to?

This paper extends the above programme of research. Within it, we present the preliminary findings that have emerged from the first phase (*Material Collection* and *Descriptive Analysis*) of our study into the actual conception and execution of the notion of value within the Lean paradigm (Womack & Jones, 1996). At the time of writing, our study was still in progress. However, we plan to have completed this and be in a position to present the full findings at ISL in Bologna.

2. LEAN THINKING

The Lean paradigm (Womack & Jones, 1996) has undoubtedly has been one of the most influential on operations and supply chain research and practice since its emergence in the early to mid-1990s. The term "Lean" itself was coined by the Massachusetts Institute of Technology researcher John Krafcik whilst he was working on the International Motor Vehicle Program (IMVP), and entered the management lexicon via his 1988 paper in the Sloan Management Review. Whilst coined by Krafcik, Schonberger (2007) notes that many people attribute the origins of the Lean paradigm to the popular book by Womack *et al*. (1990), although he asserts that Lean production-type initiatives were already well

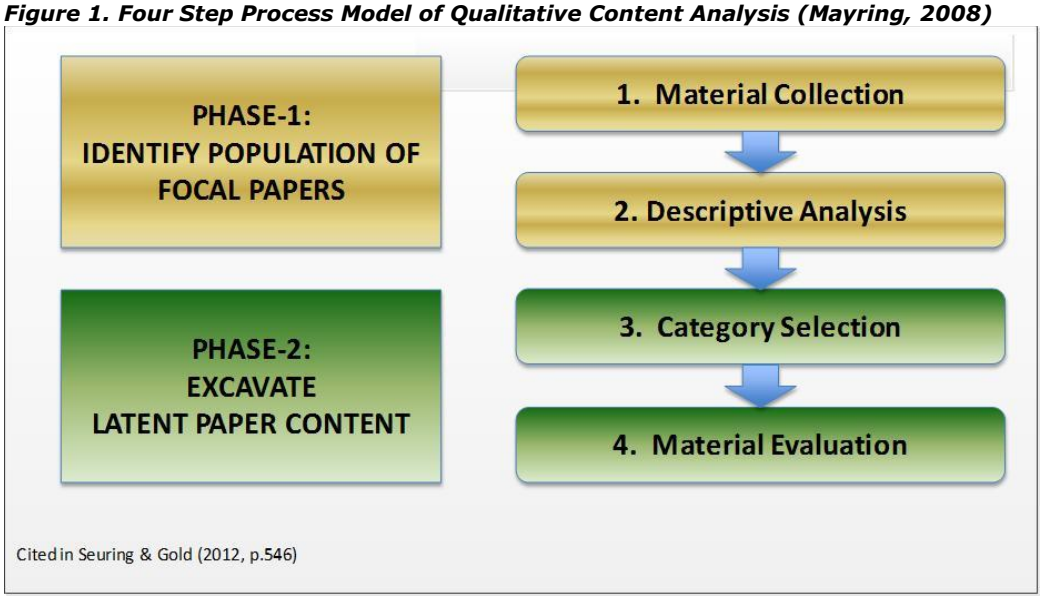
established in the US in the early 1980s albeit under different names. Even though Lean can therefore boast a lineage of over three decades, it suffers from an issue of interpretive viability (after Benders & van Veen, 2001). Samuel (2011) suggests two related reasons for this issue. The first is a lack of common definition within the literature (New, 2007; Shah & Ward, 2007; Bayou & De Korvin, 2008). The second reason is that as a concept, lean has evolved over time (Hines *et al*., 2004; Papadopoulou & Ozbayrak, 2005). To these a third reason might be added; a 'blurring of the boundaries' between the lean paradigm and similar contemporary process-oriented operations and SCM paradigms such as the Theory of Constraints (TOC), Agility and Six Sigma – not to mention the emergence of hybrid paradigms such as Leagility and Lean-Sigma.

Whilst common definition has been lacking, a common feature of publications on Lean has been reference to Womack and Jones' (1996) '*Five Lean Principles'*; bearing witness to the enduring influence of this generic prescription for achieving Leanness within the authors' seminal book on the subject. This appeal is possibly explained by the interpretive viability issue noted above, and also the logical simplicity of the prescription itself. The first principle holds that the starting point for becoming Lean is to specify 'value' from the perspective of the end customer, and usually in terms of a specific product line or product family. Principle two is to then identify the 'value stream', which the authors define as "… *the sequence of common processing steps, equipment or activities required to produce and deliver that product or product family to the end customer*". Once the value stream has been mapped, the third principle is to make the remaining (value-adding) activity steps 'flow' without delay or obstruction in order to achieve a significantly reduced manufacturing lead time. This involves eliminating the obviously wasteful steps and minimizing work queues, rework, backflows, and all other types of stoppage. Having enhanced responsiveness in this manner the fourth principle is 'pull'; meaning to produce (ie undertake value-adding steps) only in response to an actual customer demand signal, rather than making-to-forecast. The fifth and final principle is 'perfection'. This entails continuously improving the production process to produce exactly what the customer wants, exactly when they need it, with zero defects, at a price the customer is prepared to pay and with minimum waste. Therefore, as we can see from this brief summary, the conception of value is pivotal to the notion of Lean itself.

3. METHOD

The method used for this study was Content Analysis (CA). This is an established bibliographic research technique that is defined by Berelson (1952, p.55) as *"… any methodological measurement applied to text (or other symbolic materials) for social science purposes."* CA has a lineage within the SCM field, as aptly summarised by Seuring & Gold (2012). They suggest that CA typically entails two broad phases of study. Phase-1 ultimately identifies the individual articles that are subsequently to form the focus of detailed analysis from the wider population of existing articles. Phase-2 then 'excavates the latent content' of these articles; typically using some form of thematic analysis to interpret the underlying meaning and obtain insight. Seuring & Gold (*op cit*.) stress the importance of following a clear and purposeful process structure, and highlight Mayring's (2008) four-step process model as a framework for conducting qualitative content analysis. As indicated in Figure 1 the first two steps of this process model relate to Phase-1 summarised above (identify the population of focal articles), whilst the third and fourth step relate to Phase-2 (excavate latent article content).

Figure 1. Four Step Process Model of Qualitative Content Analysis (Mayring, 2008)



Step 1 in the model is *Material Collection,* during which the unit of assessment (UOA) is identified. This is usually, although not exclusively, peer-reviewed journal papers. This stage also entails a search across one or more bibliographic databases using a key word (KW) search strategy. Seuring & Gold point out that for reasons of pragmatism, the researcher will usually need to make an informed choice to condense the population of target articles to a manageable number, and that this choice needs to be justified in relation to the research objective. This typically involves being selective in the range and/or timespan of journals searched. Step 2 is *Descriptive Analysis,* during which the formal characteristics of the material are assessed to provide background information for the subsequent steps. This includes useful information about the distribution of articles across the various source journals. Identification of the population of focal articles marks the start of Step 3, *Category Selection*. This entails selecting the structural dimensions and analytical categories that are to be applied to the identified material. The last step is then *Material Evaluation*, during which the identified articles are analysed according to the dimensions established above in order to establish the requisite insight.

The method applied by the authors for the study reported upon in this paper was based upon the framework model discussed above. The scope of the material presented here equates to Phase-1 of this CA project; the identification of the set of focal articles on Lean Thinking that are subsequently to be analysed in detail during Phase-2. As indicated in the Introduction, at the time of writing this paper, Phase-2 was work in progress and is planned to be completed by the date of the symposium in Bologna so that the findings might be included in the presentation of this paper. The following section elaborates upon each of the above Phase-1 procedural steps in more detail.

4. DISCUSSION

4.1 Material Collection

The goal of this first step of the CA process was to identify the most *influential* articles on Lean for the subsequent evaluation of their treatment of the concept of 'value'. We decided to use '*number of citations'* as the proxy for an article's influence. The authors' collective experience of the Lean literature suggested that many of the most influential texts would be derived from practitioner rather than academic sources. Therefore, unusually for a CA, the UOA could not be constrained only to peer-reviewed academic journals. Given the need to identify both academic and practitioner articles and obtain citation statistics, we therefore decided to use Google Scholar (GS) as the source bibliographic database for our study.

GS is probably the largest bibliographic database. According to its press it "*…provides a simple way to broadly search for scholarly literature. From one place, you can search across many disciplines and sources: articles, theses, books, abstracts and court opinions, from academic publishers, professional societies, online repositories, universities and other web sites. Google Scholar helps you find relevant work across the world of scholarly research*" (see http://scholar.google.co.uk/intl/en/scholar/about.html). The ranking algorithm used by GS considers the full text, author, source publication and how often the article has been cited in other scholarly literature. However, it puts a particularly high weight on citation counts and the words included in the article's title, so that the first search results encountered are often the most highly cited (op cit.)

Having determined the most appropriate bibliographic source database, the next decision was to formulate an appropriate keyword (KW) search strategy. As indicated in the Introduction; Lean suffers from a particularly acute interpretive viability issue. We therefore decided to interrogate GS using the three main synonyms for Lean, whilst recognising the potentially uncomprehensive limitation of this approach. These synonyms were '*lean thinking'* (S1)*, 'lean production'* (S2) and *'lean manufacturing'* (S3). Three search queries (S1-S3) were duly constructed from these, with 'patents' and 'case law' excluded for each. The initial findings from these searches produced two useful insights (Table 1). The first of these is that the most prevalent synonym by far is 'lean production'. The second insight is a quantification of the sheer scale of the literature on this subject.

Table 1. Result of three keyword search queries across Google Scholar

Search Ref.	Key Word	Number of Hits
S1	*lean thinking*	About 532,000 results
S2	*lean production*	About 1,360,000 results
S3	*lean manufacturing*	About 385,000 results

Seuring & Gold's (2012) earlier suggestion for this first step of the CA process would therefore seem particularly prescient; pragmatism demands an informed choice to condense the results into a manageable number of focal articles. It was therefore decided to capture the top (ie most highly cited) 20 articles identified in each of the searches S1-S3, and combine these into a focal article set (FAS) that would form the raw material for the subsequent steps of our CA process. This in turn necessitated the 'eyeballing' of the '*cited by nnnn'* statistic for each article returned, then manual entry of the appropriate article details into an Excel spreadsheet. Once entered, they could then be manipulated. The three lists were combined and duplicate entries removed to form the master FAS list. This list was then sorted according to the number of citation (high to low). The resulting top 50 most highly cited publications on Lean are listed in Table 2, and collectively represent 29,661 citations. In addition to providing reference details the table summarises the type of publication, focal industry sector discussed within, and ABS (2015) details of each of the constituent publications. These latter details are included due to the current topicality of this journal ranking instrument within the UK higher education sector.

Table 2. Top 50 most highly cited publications on Lean

No.	Cited By	Source Search	REFERENCE DETAILS				Publication Type	Sector	ABS (2015) JOURNAL DETAILS		
			Authors	Year	Title	Publication Details			Listed?	Ranking	Subject Area
1	10,759	S2	Womack, JP, Jones, DT and Roos, D	1990/2007	*The Machine that Changed the World*	Free Press: New York	Book	GENERIC	NO	N/A	N/A
2	5,279	S3	**WOMACK, J.P. and JONES, D.T.**	1996/2010	*Lean Thinking: Banish Waste and Create Wealth in your Corporation*	Simon & Schuster: New York	Book	GENERIC	NO	N/A	N/A
3	1,521	S2	Groover, MP	2007	Automation, Production Systems, and Computer-Integrated Manufacturing	3rd ed., Prentice Hall Press: Upper Saddle River, NJ	Book	GENERIC	NO	N/A	N/A
4	1,020	S1	Naylor, B, Naim, MM and Berry, D	1999	Leagility: integrating the lean and agile manufacturing paradigms in the total supply chain	*International Journal of Production Economics,* 62(1-2), pp.107-118.	Journal Paper	GENERIC	YES	3	Operations & Technology Management
5	892	S1	Shah, R and Ward, PT	2003	Lean manufacturing: context, practice bundles, and performance	*Journal of Operations Management,* 21(2), pp.129-149	Journal Paper	GENERIC	YES	4*	Operations & Technology Management
6	719	S2	Krafcik, JF	1988	Triumph of the lean production system	*Sloan Management Review,* 30 (1), pp.41-52.	Journal Paper	AUTOMOTIVE	YES	3	General Management, Ethics & Social Responsibility
7	619	S3	Hines, P., Holweg, M. and Rich, N.	2004	Learning to evolve: a review of contemporary lean thinking	*International Journal of Operations and Production Management,* 24(10), pp.994-1011	Journal Paper	GENERIC	YES	4	Operations & Technology Management
8	560	S2	Shah, R. and Ward, P.T.	2007	Defining and developing measures of lean production	*Journal of Operations Management,* 25(4), pp.785-805	Journal Paper	GENERIC	YES	4*	Operations & Technology Management
9	472	S2	Holweg, M	2007	The genealogy of lean production	*Journal of Operations Management,* 25(2), pp.420-437	Journal Paper	GENERIC	YES	4*	Operations & Technology Management
10	386	S2	Berggren, C	1993	*Alternatives to Lean Production: Work Organization in the Swedish Auto Industry*	Cornell University Press: Ithaca, New York.	Book	AUTOMOTIVE	NO	N/A	N/A
11	385	S1	Abdulmalek, FA and Rajgopal, J	2007	Analyzing the benefits of lean manufacturing and value stream mapping via simulation: a process sector case study	*International Journal of Production Economics,* 107(1), pp.223-236.	Journal Paper	PROCESS	YES	3	Operations & Technology Management
12	370	S2	Landsbergis, PA, Cahill, J and Schnall, O	1999	The impact of lean production and related new systems of work organization on worker health.	*Journal of Occupational Health Psychology,* 4(2), pp.108-130.	Journal Paper	AUTOMOTIVE	YES	4	Psychology (Occupational)
13	362	S2	King, AA and Lenox, MJ	2001	Lean and green? An empirical examination of the relationship between lean production and environmental performance	*Production and Operations Management,* 10(3), pp.244-256	Journal Paper	MANUFACTURING	YES	4	Operations & Technology Management
14	356	S2	Karlsson, C and Ahlstrom, P	1996	Assessing changes towards lean production	*International Journal of Operations and Production Management,* 16(2), pp.24-41.	Journal Paper	GENERIC	YES	4	Operations & Technology Management
15	314	S2	Dennis, P	2007	*Lean Production Simplified: A Plain-Language Guide to the World's Most Powerful Production System*	2nd ed., Productivity Press: New York	Book	GENERIC	NO	N/A	N/A
16	314	S2	MacDuffie, JP and Helper, S	1997	Creating lean suppliers: Diffusing lean production through the supply chain.	*California Management Review,* 39(4), pp.118-151.	Journal Paper	AUTOMOTIVE	YES	3	General Management, Ethics & Social Responsibility
17	283	S2	Dahlgaard, JJ and Dahlgaard-Park, SM	2006	Lean production, six sigma quality, TQM and company culture	*TQM Magazine,* 18(3), pp.263-281	Journal Paper	GENERIC	NO	N/A	N/A
18	280	S1	Feld, WM	2000	*Lean Manufacturing: Tools, Techniques, and How to Use Them*	CRC Press: Boca Raton, FL	Book	GENERIC	NO	N/A	N/A
19	272	S3	Murman et al.	2002	*Lean Enterprise Value: Insights from MIT's Lean Aerospace Initiative*	Palgrave Macmillan: New York	Book	AEROSPACE	NO	N/A	N/A
20	264	S1/S2	**LIKER, JK**	2004	*Becoming Lean: Inside Stories of US Manufacturers*	Productivity Press: New York	Book	GENERIC	NO	N/A	N/A
21	249	S2	Lewis, MA	2000	Lean production and sustainable competitive advantage	*International Journal of Operations and Production Management,* 20(8), pp.959-978.	Journal Paper	GENERIC	YES	4	Operations & Technology Management
22	247	S2	Delbridge, R	1998	*Life on the Line in Contemporary Manufacturing: The Workplace Experience of Lean Production and the "Japanese" Model*	Oxford University Press: New York	Book	GENERIC	NO	N/A	N/A
23	235	S2	Levy, DL	1997	Lean production in an international supply chain	*MIT Sloan Management Review,* 38(2), pp.94-102.	Journal Paper	GENERIC	YES	3	General Management, Ethics & Social Responsibility
24	230	S2	Berggren, C	1993	Lean production—the end of history?	*Work, Employment & Society,* 7(2), pp.163-188	Journal Paper	GENERIC	YES	4	HRM and Employment Studies
25	229	S2	Bowen, DE and Youngdahl, WE	1998	"Lean" service: in defense of a production-line approach	*International Journal of Service Industry Management,* 9(3), pp.207-225.	Journal Paper	SERVICE	NO	N/A	N/A
26	205	S2	Nicholas, JM	1998	*Competitive Manufacturing Management: Continuous Improvement, Lean Production, Customer-Focused Quality*	Irwin/McGraw-Hill: Boston	Book	MANUFACTURING	NO	N/A	N/A
27	184	S1/ S3	**GRIEVES, M**	2005	*Product Lifecycle Management: Driving the Next Generation of Lean Thinking*	McGraw Hill Professional: New York	Book	GENERIC	NO	N/A	N/A
28	178	S1/S3	**MELTON, T**	2005	The benefits of lean manufacturing: what lean thinking has to offer the process industries	*Chemical Engineering Research and Design,* 83(6), pp.662-673.	Journal Paper	PROCESS	NO	N/A	N/A
29	175	S2	Sandberg, A	1995	Enriching production: perspectives on Volvo's Uddevalla plant as an alternative to lean production	*Munich Personal RePEc Archive (MPRA),* Paper No. 10785	Working Paper	AUTOMOTIVE	NO	N/A	N/A
30	173	S1	Pavnaskar, SJ, Gershenson, JK and Jambekar, AB	2003	Classification scheme for lean manufacturing tools	*International Journal of Production Research,* 41(13), pp.3075-3090	Journal Paper	GENERIC	YES	3	Operations & Technology Management
31	143	S1	Worley, JM and Doolen, TL	2006	The role of communication and management support in a lean manufacturing implementation	*Management Decision,* 44(2), pp.228-245	Journal Paper	GENERIC	YES	2	General Management, Ethics & Social Responsibility
32	142	S3	King, D.L., Ben-Tovim, D. and Bassham, J.	2006	Redesigning emergency department patient flows: application of Lean Thinking to health care	*Emergency Medicine Australasia,* 18(4), pp.391-397	Journal Paper	HEALTHCARE	NO	N/A	N/A
33	127	S1	Detty, RB and Yingling, JC	2000	Quantifying benefits of conversion to lean manufacturing with discrete event simulation: a case study	*International Journal of Production Research,* 38(2), pp.429-445.	Journal Paper	GENERIC	YES	3	Operations & Technology Management
34	116	S3	Jones, D.T. and Mitchell, A.	2006	Lean thinking for the NHS	*NHS Confederation, London*	Conference Paper	HEALTHCARE	NO	N/A	N/A
35	112	S1	Yang, MGM, Hong, P and Modi, SB	2011	Impact of lean manufacturing and environmental management on business performance: an empirical study of manufacturing firms	*International Journal of Production Economics,* 129(2), pp.251-261	Journal Paper	MANUFACTURING	YES	3	Operations & Technology Management
36	110	S3	Haque, B. and James-Moore, M.	2004	Applying lean thinking to new product introduction	*Journal of Engineering Design,* 15(1), pp.1-31.	Journal Paper	AEROSPACE	NO	N/A	N/A
37	110	S1	Sullivan, WG, McDonald, TN and Van Aken, EM	2002	Equipment replacement decisions and lean manufacturing	*Robotics and Computer-Integrated Manufacturing,* 18(3-4), pp.255-265	Journal Paper	GENERIC	NO	N/A	N/A
38	110	S1	Wu, YC	2003	Lean manufacturing: a perspective of lean suppliers	*International Journal of Operations and Production Management,* 23(11), pp.1349-1376	Journal Paper	GENERIC	YES	4	Operations & Technology Management
39	109	S3	Joosten, T., Bongers, I and Janssen, R.	2009	Application of lean thinking to health care: issues and observations	*International Journal for Quality in Health Care,* 21(5), pp.341-347.	Journal Paper	HEALTHCARE	NO	N/A	N/A
40	106	S1	Motwani, J	2003	A business process change framework for examining lean manufacturing: a case study	*Industriol Management & Data Systems,* 103(5), pp.339-346	Journal Paper	GENERIC	YES	2	Information Management

Table 2. Top 50 most highly cited publications on Lean (cont.)

No.	Cited By	Source Search	REFERENCE DETAILS				Publication Type	Sector	ABS (2015) JOURNAL DETAILS		
			Authors	Year	Title	Publication Details			Listed?	Ranking	Subject Area
41	104	S1	Wilson, L	2009	*How to Implement Lean Manufacturing*	McGraw Hill Professional: New York	Book	GENERIC	NO	N/A	N/A
42	102	S3	Holden, R.J.	2011	Lean thinking in emergency departments: a critical review	*Annals of Emergency Medicine,* 57(3), pp.265-278.	Journal Paper	HEALTHCARE	NO	N/A	N/A
43	101	S3	Mazzocato, P., Savage, C. and Brommels, M.	2010	Lean thinking in healthcare: a realist review of the literature	*Quality and Safety in Health Care,* 19, pp.376-382.	Journal Paper	HEALTHCARE	NO	N/A	N/A
44	100	S1	Dickson, EW, Singh, S, Cheung, DS, Wyatt, CC and Nugent, AS	2009	Application of lean manufacturing techniques in the emergency department	*Journal of Emergency Medicine,* 37(2), pp.177-182	Journal Paper	HEALTHCARE	NO	N/A	N/A
45	99	S3	Ben-Tovim, D.I., Bassham, J.E., Bolch, D., Martin, M.a., Dougherty, M. and Szwardcbord, M.	2007	Lean thinking across a hospital: redesigning care at the Flinders Medical Centre	*Australian Health Review,* 31(1), pp.10-15.	Journal Paper	HEALTHCARE	NO	N/A	N/A
46	98	S3	Young, T.P. and McClean, S.I.	2008	A critical look at Lean Thinking in healthcare	*Quality and Safety in Health Care,* 17, pp.382-386.	Journal Paper	HEALTHCARE	NO	N/A	N/A
47	97	S1	Fullerton, RR and Wempe, WF	2009	Lean manufacturing, non-financial performance measures, and financial performance	*International Journal of Operations and Production Management*, 29(3), pp.214-240	Journal Paper	MANUFACTURING	YES	4	Operations & Technology Management
48	82	S3	Poppendieck	2011	Principles of lean thinking	*IT Management Select,* Winnipeg, pp.1-7	Book Chapter	GENERIC	NO	N/A	N/A
49	81	S1	Hallgren, M and Olhager, J	2009	Lean and agile manufacturing: external and internal drivers and performance outcomes	*International Journal of Operations and Production Management,* 29(10), pp.976-999	Journal Paper	GENERIC	YES	4	Operations & Technology Management
50	80	S1	Meyers, FE and Stewart, JR	2002	*Motion and Time Study for Lean Manufacturing*	Prentice Hall: Upper Saddle River, NJ	Book	GENERIC	NO	N/A	N/A

4.2 Descriptive Analysis

Turning first to an analysis of the publication types contained within the above table, and we find that 34 (68%) of the most highly cited publications on Lean are journal articles. Thirteen (26%) are books, whilst the balance is composed of one book chapter, one conference paper and a working paper. However, when the citation data represented by each of these categories is considered, a different picture emerges. The 13 books represent 19,895 (67%) of the total citations, whilst the 34 journal papers collectively represent only 9,393 (32%) of the citations. A cursory examination of the above table reveals a very distinct skew in the data, with the top three publications accounting for 17,559 (60%) of the total citations, and all three of these being books. In fact, Womack and Jones' two seminal books (Womack *et al.,* 1990; Womack & Jones, 1996) are unsurprisingly the two most highly cited works on Lean, and on their own account for 16,038 (54%) of the total citations. These statistics highlight the highly a-theoretical nature of much of the Lean literature.

When the journal papers are further analysed with regard to their ABS (2015) status, further insight is provided. Of the 34 journal papers in total, 22 (65%) appear in ABS (2015) listed journals. These represent 7,732 (26%) of the total citations; collectively less than half the total citations achieved by Womack & Jones' two books (above). Unsurprisingly, the majority (15) of these journals are categorised under the '*Operations and Technology Management'* ABS (2015) subject code. Table 3 furthers deconstructs citation performance within each of the five ABS journal rank categories. It should be pointed out that the highest ranked journal within the top 50 Lean publications listed within Table 2 is Naylor *et al*. (1999). This is contained within an ABS (2015) '3' ranked journal and alone has 1,020 citations. Therefore 12 (35%) of the journal papers are drawn from non-ABS (2015) listed journals. These collectively represent 1,661 of the total citations; an average of 49 per paper.

Table 4 provides a sector analysis of the 50 Lean publications listed in Table 2. Each publication was scrutinised to identify the focal industry sector discussed within. The focus of many of these was very generic and did not discuss any sector in particular (or cited examples or testimonials from multiple sectors). Such publications were categorised as 'Generic'. The following table identifies the number of publications (and cumulative citation total) by publication type within each sector category. This yielded a number of interesting findings.

Table 3. Lean journal paper ABS (2015) Rank analysis

ABS (2015) Rank Category	Papers in this Category	Citations	Average Citations Per Paper
4*	3 (9%)	1,924 (6.5%)	641
4	9 (27%)	2,474 (8.3%)	275
3	8 (24%)	3,085 (10.4%)	386
2	2 (6%)	249 (0.8%)	125
1	0	0	0
TOTALS	**34 (100%)**	**7,732 (26%)**	**351**

Table 4. Lean publication industry/ sector analysis

Industry/ Sector	TYPE OF PUBLICATION				
	Book	**Book Chapter**	**Conference Paper**	**Journal Paper**	**Working Paper**
AEROSPACE	1 (272)			1 (110)	
AUTOMOTIVE	1 (386)			3 (1,403)	1 (175)
GENERAL	10 (19,032)	1 (82)		17 (5,766)	
HEALTHCARE			1 (116)	7 (751)	
MANUFACTURING	1 (205)			3 (571)	
PROCESS				2 (563)	
SERVICE				1 (229)	

The first of these findings was the highly generic nature of much of this Lean literature, with 27 (54%) of the identified publications accounting for 24,798 (84%) of the total citations falling into this category. This again supports the a-theoretical assertion made earlier. Given the origins of the Lean paradigm, it was very surprising that only five of the identified top 50 Lean publications specifically addressed the Automotive industry. Likewise, we were surprised to find that seven of the identified publications were specific to the Healthcare sector. This latter point underpins the extent of the diffusion of the Lean paradigm and growing interest in its potential healthcare applications.

5. CONCLUSIONS & FUTURE WORK

As we stated in the Introduction, this paper summarises only the preliminary findings that have emerging from Phase-1 of our current study into the notion of value within the Lean paradigm. Our immediate future work will be to complete Phase-2 of this CA in time for presentation at Bologna. With reference to Figure 1, this will involve completion of the *Category Selection* and *Material Evaluation* steps. To cast some light on our planned approach, we intend to search through the content of all 50 of the publications listed in Table 2; identify every instance of a reference to the term 'value' or 'values'; then copy and paste the host sentence/paragraph (as applicable to contextualise each such instance) into a separate file per publication.

We have already conducted a systematic literature review and have identified a number of conceptual and theoretical papers that specifically characterise and categorise the evolution of the conception of 'customer value'. We have built an affinity map of the most comprehensive, extensive and commonly cited of these. This body of literature will be used as a point of reference for evaluating the

content extracted from each of the Lean publications, to see if it is possible to establish a prevailing conception of value within the Lean material; how this stands in relation to the wider theory on customer value (above); and (maybe) how this Lean conception has evolved over time.

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