

Motivation theory in research on agile project management

A systematic literature review

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Motivation theory in research on agile project management: A systematic literature review

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1. Research questions

The research questions addressed by this study are:

RQ1: What has been reported about motivation and the significance of motivation among project participants in projects applying agile methodology?

RQ2: What theoretical framework has been used in such studies?

2. Research methodology and design

This literature review, was designed and planned using as guidance the approach for systematic literature reviews from Kitchenham, Brereton, Budgen, Turner, Bailey and Linkman (2009), Jalali and Wohlin (2011), and Petersen Feldt, Mujtaba and Mattsson (2008). The following sections present the search process, inclusion and exclusion criteria, data analysis and results.

3. Search process and Inclusion and exclusion criteria

This section presents the inclusion and exclusion criteria applied for the selection of texts to be included and assessed in the review.

Time limit

Since the term agile methodology has been used in its present meaning only since 2001 (Larman & Basili 2003; Beck et al. 2001), it is unlikely that research prior to this would be relevant to this study. However, it was decided that no "from" time limit needed to be explicitly defined for the scope, since it was unlikely that such a limitation would have no real impact on the scope.

Peer-reviewed articles

The research scope was limited to peer-reviewed journal articles. Initial test search in a few databases including conference papers yielded a large number of results. Since this would mean that the retrieval and selection process would grow beyond what was possible to achieve within the range of this research, the decision was taken to limit the scope to include peer-reviewed journal articles only.

Also, dissertations, books and book chapters were excluded from the scope of similar reason.

Databases

The search was limited to the databases listed in Table 1.

Table 1: Searched databases

Database	Web address	Rationale for inclusion
Scopus	scopus.com	Very broad and general database.
ACM Digital Library	dl.acm.org	“Association for Computing Machinery (ACM)” “Full text of every article ever published by ACM and bibliographic citations from major publishers in computing.” (from the database homepage)
IEEE Xplore Digital Library	ieeexplore.ieee.org	“... scientific and technical content published by the IEEE (Institute of Electrical and Electronics Engineers) and its publishing partners.” “... more than 3-million full-text documents from [...] publications in electrical engineering, computer science and electronics.” “... over 160 journals, over 1,200 conference proceedings, more than 3,800 technical standards, over 1,000 eBooks and over 300 educational courses.” (from the database homepage)
AIS Electronic Library	aisel.aisnet.org	“... repository for research papers and journal articles relevant to the information systems academic community. [...] conference papers for AIS-sponsored and affiliated conferences, content from AIS SIGs and Chapters and the most prominent academic journals, both sponsored by the AIS and other top journals in the field.” (from the database homepage)
Engineering Village	www.engineeringvillage2.org	“..hosts 12 databases that cut across engineering disciplines and content sources” Among these are: Compendex & Ei Backfile: “engineering disciplines” Inspec & Inspec Archive: “physics, electrical engineering, electronics and computer science information. Produced by the Institution of Engineering and Technology (IET)” (from the database homepage)
Business Source Premier	web.ebscohost.com	Broad database for >10,000 journals in Management and Social Sciences.
PsycINFO	search.proquest.com	“..the international psychological literature from the 1800s to the present. Documents indexed include journals, articles, books, dissertations and more. 90% of the 3,000+ titles indexed in PsycINFO are peer-reviewed.” (from the database homepage)

Search strings

Search strings used was “agile” AND “motivation”, as this very wide search seemed to include all variations of references to agile methods and all references to any aspect of motivation. It was expected that a wide search like this would yield a substantial number of irrelevant results, due to the search terms is used in a large number of situations outside of the distinct meaning in relation to agile project management methods (such as when used I contexts like “an *agile* system” or “a motor can move *agilely* forward”) and motivation theory (such as when used for “the *motivation* for this study”). We expected this would force us to manually exclude several irrelevant texts, but decided to accept this disadvantage for the benefit of using a simple search strategy that would minimize the risk of missing any relevant texts.

Search limited to Title, Abstract and Keywords

The search was limited to Title, Abstract and Keywords, since it was expected that research that used the words “agile” or “motivation” only in the full text was unlikely to have motivational aspects in relation to agile methodology as its focus, and thus fall outside of the scope for this study.

When technically possible, the search criteria were limited to peer-reviewed journal articles, and when this was technically impossible, a manual exclusion of other kinds of literature was performed.

Language

Only articles written in English were selected (resulting in only a small number of articles being manually excluded).

4. The actual search process performed

In this section, the actual search process is presented step by step. See Table 3 (below) for a summary of the step by step exclusion process.

Step 1: Identifying potentially relevant studies in the databases.

The search was made in December 12, 2012.

The used search strings (per individual database) are presented in Appendix D.

A total of 158 texts were found. Meta information for all found articles was exported to Refworks database, then exported from Refworks to an Excel sheet (Filename: “Artiklar-retrieved-01”), that was later used for keeping track of the exclusion process.

Step 2: Eliminating duplicate texts.

By comparing title and (if in doubt) checking abstract, 63 duplicate results were excluded.

Step 3a: Manual exclusion of obviously irrelevant texts.

By inspecting title and abstract (when in doubt), 80 texts were excluded due to various reasons, such as not being a peer-reviewed article, being related to a subject area outside the scope of this study, or not applying motivation theory. See Appendix A for a list of the thus eliminated articles, including the reasons for exclusion.

After this manual assessment, 15 potentially relevant articles were identified.

Step 3b: Manual exclusion of irrelevant texts.

The remaining 15 papers were studied in detail. When in doubt, the web homepage of the publishing journal was visited to determine whether published articles are peer-reviewed. Article full text was read through and examined when needed to determine whether the article was potentially relevant (in the ISD area, dealing with agile methods, and referring to motivational concepts). 11 articles were excluded during this step (See Appendix B for a list and reasons for exclusion).

After this manual assessment, 4 articles remained.

Step 3c: Manual assessment of remaining articles.

The remaining four articles were again read in their entirety and commented on. Three of the articles were not using any explicit motivation theory, even if motivation

as a concept was referred to in all three. See Appendix C for a list, comments to each article and reasons for exclusion.

Only one article (McHugh et al. 2011) explicitly used something similar to a motivation theory, even though the theory in this case was merely a list compiled as an inventory of motivation concepts used in articles on motivation in software development (Beecham et al. 2008).

Table 3: Summary of the exclusion process, step by step.

Selection step	Excluded texts	Remaining texts	See indicated Appendix for list of articles
1: Identifying texts using search strings		158	
2: Eliminating duplicates	63	95	
3a: Manual exclusion of irrelevant texts (title, abstract)	80	15	Appendix A
3b: Manual exclusion of irrelevant texts (full article)	11 A) Not peer-reviewed (4) B) No theory applied (1) C) No motivation theory (4) D) Not English (1) E) Wrong subject area (1)	4	Appendix B
3c: Manual assessment of remaining articles (full article)	3 No explicit motivation theory applied (3)	1	Appendix C

5. Answers to research questions

RQ1: What has been reported about motivation and the significance of motivation among project participants in projects applying agile methodology?

The answer to the first research question is that very little has been reported, at least if you require the reporting being based in some explicit and defined theoretical constructs of motivation. Only one text is explicitly reporting research on the motivation of project participants (McHugh et al. 2011).

This single research article is an exploratory case study of two project teams in two different countries and organizations. The method is based on open interviews and the research restricted to the participants' perception of using three selected Scrum features (iteration planning, daily stand-up and iteration retrospective). The aim is to "explore if and how agile practices contribute to motivation or de-motivation in an agile project management (APM) team" (p. 3).

McHugh et al. find that "[a]s a consequence of using these practices, individuals have clearly defined goals, share and rotate tasks, feel part of the team, are very supportive and willing to assist each other, all of which help to motivate team members. The study also highlights how the practices may cause de-motivation through increased stress, and pressure to deliver" (p. 19).

RQ2: What theoretical framework has been used in such studies?

The theoretical framework for motivation applied in the single study found (McHugh et al. 2011) is a list compiled as an inventory of motivation/de-motivation concepts used in articles on motivation in software development included in a literature review by Beecham, Baddoo, Hall, Robinson and Sharp (2008). In this sense, the theoretical basis for McHugh and colleagues' analysis of data was not a traditional theory, although at least it was an explicit set of motivational concepts.

The answer to the second research question will therefore be that this literature review cannot identify any explicitly applied well-defined theory on motivation in research on motivation among project participants in projects applying agile methodology.

References

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Appendix A.**Bibliographic data for articles eliminated in step 3a (Irrelevant articles)**

#	Article	Reason for exclusion
1	[No author] (2004). Release your people's potential high performance working]. <i>Works Management</i> , 57 (8), 16-18.	Not peer-reviewed
2	Abdalla, H. & Tun-Hsueh Chan (2011). An integrated design framework for mass customisation in the consumer electronics industry. <i>International Journal of Computer Applications in Technology</i> , 40 (1-2), 37-52.	Outside scope.
3	Alleman, G. (2004). Blending agile development methods with CMMI. <i>Cutter IT Journal</i> , 17 (6), 5-15.	Outside scope. No motivation theory.
4	Ambler, S.W. (2002). Tools and evidence. <i>Software Development</i> , 10 (5), 65-6.	No motivation theory.
5	Arunava, C. (2007). Semantically enabled SOA service-oriented architecture]. <i>Dr.Dobb's Journal</i> , (397), 20-6.	Outside scope. No motivation theory.
6	Baptista, R., Silva, M.B. & Saraiva, C. (2006). Developments for rapid tooling application in sheet metal forming. <i>Materials Science Forum</i> , 514-516 1516-20.	Outside scope.
7	Bolgiano, A. (2004). Motivating members: Firefighters fitness challenge. <i>Fire Engineering</i> , 157 (12), 83-85.	Outside scope.
8	Boscoianu, M., Pahonie, R. & Coman, A. (2008). Some aspects regarding the adaptive control of a flying wing- micro air vehicle with flexible wing tips. <i>WSEAS Transactions on Systems</i> , 7 (7), 857-867.	Outside scope.
9	Cheng, L. (2011). Assessing performance of utilizing organizational modularity to manage supply chains: Evidence in the US manufacturing sector. <i>International Journal of Production Economics</i> , 131 (2), 736-746.	Outside scope.
10	Cherkasova, L., Gupta, D. & Vahdat, A. (2007). Comparison of the three CPU schedulers in xen. <i>Performance Evaluation Review</i> , 35 (2), 42-51.	Outside scope.
11	Cochran, D., Suvorova, S., Howard, S.D. & Moran, B. (2009). Waveform libraries: Measures of effectiveness for radar scheduling. <i>IEEE Signal Processing Magazine</i> , 26 (1), 12-21.	Outside scope.
12	Cochran, J.K. & Marquez Uribe, A. (2005). A set covering formulation for agile capacity planning within supply chains. <i>International Journal of Production Economics</i> , 95 (2), 139-149.	Outside scope.
13	Compennolle, T. (1999). The changing role of IT executives retail]. <i>Chain Store Age</i> , 75 (10), 26-30.	Outside scope.
14	Dubey, R. & Ghai, S. (2010). Innovative atmosphere relating to success factors of entrepreneurial managers in the organization agility-an empirical study. <i>International Journal of Innovation Science</i> , 2 (3), 97-102.	Outside scope.
15	Faria, E.S.J., Yamanaka, K. & Tavares, J.A. (2012). eXtreme learning of programming - A methodology based in eXtreme programming to programming learning. <i>IEEE Latin America Transactions</i> , 10 (2), 1589-94.	Outside scope (methods for teaching XP programming).
16	Faria, E.S.J., Yamanaka, K. & Tavares, J.A. (2012). A methodology for computer programming teaching based on bloom's taxonomy of educational objectives and applied through the pair programming. <i>Latin America Transactions, IEEE (Revista IEEE America Latina)</i> , 10 (2), 1589-1594.	Outside scope (methods for teaching XP programming).
17	Firebaugh, S.L. & Piepmeier, J.A. (2008). The RoboCup nanogram league: An opportunity for problem-based undergraduate education in microsystems. <i>IEEE Transactions on Education</i> , 51 (3), 394-399.	Outside scope.

18	Fritts, D.C., Janches, D., Iimura, H., Hocking, W.K., Bageston, J.V. & Leme, N.M.P. (2012). Drake antarctic agile meteor radar first results: Configuration and comparison of mean and tidal wind and gravity wave momentum flux measurements with southern argentina agile meteor radar. <i>Journal of Geophysical Research D: Atmospheres</i> , 117 (2),.	Outside scope.
19	Fritts, D.C., Janches, D., Iimura, H., Hocking, W.K., Mitchell, N.J., Stockwell, R.G., Fuller, B., Vandeppeer, B., Hormaechea, J., Brunini, C. & Levato, H. (2010). Southern argentina agile meteor radar: System design and initial measurements of large-scale winds and tides. <i>Journal of Geophysical Research D: Atmospheres</i> , 115 (18),.	Outside scope.
20	Genero, M., Poels, G. & Piattini, M. (2008). Defining and validating metrics for assessing the understandability of entity-relationship diagrams. <i>Data & Knowledge Engineering</i> , 64 (3), 534-57.	Outside scope.
21	Ghisellini, G. & Tavecchio, F. (2008). The blazar sequence: A new perspective. <i>Monthly Notices of the Royal Astronomical Society</i> , 387 (4), 1669-80.	Outside scope.
22	Goodhue, D.L., Chen, D.Q., Boudreau, M.C., Davis, A. & Cochran, J.D. (2009). Addressing business agility challenges with enterprise systems. <i>MIS Quarterly Executive</i> , 8 (2), 73-87.	Outside scope (agility as having a responsive IT infrastructure).
23	Gou, L.- & Meszaros, P. (2007). GLAST prospects for swift-ERA afterglows. <i>Astrophysical Journal</i> , 668 (1), 392-9.	Outside scope.
24	Guerra, D. (2010). Capital projects in the new economy. <i>Industrial Engineer</i> , 42 (12), 47-51.	Outside scope.
25	Hartley, J.L., Greer, B.M. & Park, S. (2002). Chrysler leverages its suppliers' improvement suggestions. <i>Interfaces</i> , 32 (4), 20-7.	Outside scope (business processes).
26	Jansson, P.M., Ramachandran, R.P., Schmalzel, J.L. & Mandayam, S.A. (2010). Creating an agile ECE learning environment through engineering clinics. <i>IEEE Transactions on Education</i> , 53 (3), 455-462.	Outside scope (education methods).
27	Jennings, N.R., Norman, T.J., Faratin, P., O'Brien, P. & Odgers, B. (2000). Autonomous agents for business process management. <i>Applied Artificial Intelligence</i> , 14 (2), 145-189.	Outside scope (business processes).
28	Jiehan, Z., Guangleng, X., Heming, Z. & Qingliang, Z. (2003). Conceptual framework and curriculum for networked agile manufacturing. <i>Tsinghua Science and Technology</i> , 8 (2), 192-7.	Outside scope (manufacturing).
29	Johnston, K. (2007). Folksonomies, collaborative filtering and e-business: Is enterprise 2.0 one step forward and two steps back? <i>Proceedings of the European Conference on Knowledge Management, ECKM</i> , 506-511.	Outside scope (e-business).
30	Jrgensen, N. (2006). The boeing 777: No chainsaw massacres, please! <i>Journal of Integrated Design and Process Science</i> , 10 (2), 79-91.	Outside scope. No motivation theory.
31	Kahalas, H. & Suchon, K. (1995). Managing a perpetual idea machine: Inside the creator's mind. <i>Academy of Management Executive</i> , 9 (2), 57-66.	Outside scope. No motivation theory.
32	Kaminski, H. (2006). Integration and impact of grid computing in financial services - an assessment by DataSynapse. <i>Information Management & Consulting</i> , 21 (2), 78-85.	Outside scope.
33	Kumar, D.S., Kumar, M.U. & Shrivani, D. (2009). Designing dependable agile layered security architecture solutions - web 2.0 services case study. <i>International Journal of Recent Trends in Engineering</i> , 2 (4), 31-3.	Outside scope. No motivation theory.
34	Kuong, J. (2011). Corporate and IT governance for cloud computing, the need for service level agreements (SLAs) to minimize the threats that come with this new increasingly popular technology. <i>COM-SAC, Computer Security, Auditing and Controls</i> , 38 (2), 2-7.	Outside scope (Cloud Computing).
35	Larman, C. (2003). <i>Agile processes and modeling</i> . [Electronic] Tillgänglig: http://www.scopus.com/inward/record.url?eid=2-s2.0-	Not peer-reviewed

	35248899465&partnerID=40&md5=bc5d06be3334b800f83a437348cb6edg [11 December 2012].	(keynote speech).
36	Lee, C.K.M., Lau, H.C.W., Yu, K.M. & Ip, W.H. (2005). Enhancement of product development through product information mark-up language. <i>Journal of Engineering Design</i> , 16 (1), 91-110.	Outside scope.
37	Leve, F., Tatsch, A. & Fitz-Coy, N. (2007). A scalable control moment gyro design for attitude control of micro-, nano-, and pico-class satellites. <i>Advances in the Astronautical Sciences</i> , 128 235-46.	Outside scope.
38	Lindquist, E. (2010). From rhetoric to blueprint: The moran review as a concerted, comprehensive and emergent strategy for public service reform. <i>Australian Journal of Public Administration</i> , 69 (2), 115-151.	Outside scope.
39	Liu, F., Lee, K. & Yang, C. (2012). Hydrodynamics of an undulating fin for a wave-like locomotion system design. <i>IEEE/ASME Transactions on Mechatronics</i> , 17 (3), 554-562.	Outside scope.
40	Liu, W. & Cheraghi, S.H. (2004). A generic distributed architecture for nonconformance diagnosing systems. <i>International Journal of Computer Integrated Manufacturing</i> , 17 (5), 467-477.	Outside scope.
41	Macdonald, D.D. (2004). Fueling the hydrogen economy. <i>Materials Today</i> , 7 (6), 64.	Outside scope.
42	Mehrabian, A.R. & Lucas, C. (2009). Intelligent-adaptive flight control with a physiologically motivated algorithm. <i>International Journal of Modelling and Simulation</i> , 29 (1), 12-18.	Outside scope.
43	Mei, X., Jiang, A., Li, S., Fan, Y., Huang, C. & Zheng, X. (2010). Enabling effective automated composition compensation with paired net for reliable web services transaction. <i>Journal of Information and Computational Science</i> , 7 (14), 3027-3034.	Outside scope.
44	Misra, S. Agrawal, A., Liao, W. & Choudhary, A. (2011). Anatomy of a hash-based long read sequence mapping algorithm for next generation DNA sequencing. <i>Bioinformatics</i> , 27 (2), 189-195.	Outside scope.
45	Mont, M.C., Beres, Y., Pym, D. & Shiu, S. (2010). Economics of identity and access management: A case study on enterprise business services. <i>HP Laboratories Technical Report</i> , (12),.	Outside scope.
46	Mont, M.C., Beres, Y., Pym, D. & Shiu, S. (2010). Economics of identity and access management: Providing decision support for investments. <i>HP Laboratories Technical Report</i> , (11),.	Outside scope.
47	Moraes, R. (2007). Technology and human resources in harmony; tecnologia e recursos humanos em sintonia. <i>O Papel (Brazil)</i> , 68 (1), 38-39.	Outside scope. Not peer-reviewed.
48	Motamedi, A. & Bahai, A. (2008). Optimal channel selection for spectrum-agile low-power wireless packet switched networks in unlicensed band. <i>EURASIP Journal on Wireless Communications and Networking</i> , 896420 (10 pp.).	Outside scope.
49	Moyaux, T., Chaib-draa, B. & D'Amours, S. (2007). Information sharing as a coordination mechanism for reducing the bullwhip effect in a supply chain. <i>IEEE Transactions on Systems, Man and Cybernetics, Part C (Applications and Reviews)</i> , 37 (3), 396-409.	Outside scope.
50	Narasimhadevara, A., Radhakrishnan, T., Leung, B. & Jayakumar, R. (2008). On designing a usable interactive system to support transplant nursing. <i>Journal of Biomedical Informatics</i> , 41 (1), 137-151.	Outside scope.
51	Nobre, F.S. (2011). Core competencies of the new industrial organization. <i>Journal of Manufacturing Technology Management</i> , 22 (4), 422-43.	Outside scope.
52	Papadimitriou, S. & Terzidis, K. (2008). Scientific programming with an environment that combines effectively compiled and interpreted scripting at the java platform. <i>WSEAS Transactions on Information Science and Applications</i> , 5 (11), 1511-20.	Outside scope.
53	Park, E. & Shin, H. (2008). Reconfigurable service composition and categorization for power-aware mobile computing. <i>IEEE Transactions</i>	Outside scope.

	on <i>Parallel and Distributed Systems</i> , 19 (11), 1553-1564.	
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55	Pillai, A., Pundir, A. & Ganapathy, L. (2012). Implementing integrated lean six sigma for software development: A flexibility framework for managing the continuity: Change dichotomy. <i>Global Journal of Flexible Systems Management</i> , 13 (2), 107-116.	Outside scope (Six Sigma).
56	Plotnik, A. & Rock, S. (2011). Hybrid estimation using perceptual information: Robotic tracking of deep ocean animals. <i>IEEE Journal of Oceanic Engineering</i> , 36 (2), 298-315.	Outside scope.
57	Potter, B.G., J., Chandra, H., Simmons-Potter, K., Jamison, G.M. & Thomes, W.J., J. (2006). Photoinduced refractive index change and absorption bleaching in poly(methylphenylsilane) under varied ambients. <i>Physics and Chemistry of Glasses: European Journal of Glass Science and Technology B</i> , 47 (2), 105-9.	Outside scope.
58	Reid, R.O. & Wang, O. (2004). Bottom-trapped rossby waves in an exponentially stratified ocean. <i>Journal of Physical Oceanography</i> , 34 (4), 961-967.	Outside scope.
59	Reithofer, W. & Naeger, G. (1997). Bottom-up planning approaches in enterprise modelling - the need and the state of the art. <i>Computers in Industry</i> , 33 (2-3), 223-235.	Outside scope (enterprise modeling).
60	Rosado, D.G., Gomez, R., Mellado, D. & Fernandez-Medina, E. (2012). Security analysis in the migration to cloud environments. <i>Future Internet</i> , 4 (2), 469-87.	Outside scope.
61	Sadasivam, R.S., Delaughter, K., Crenshaw, K., Sobko, H.J., Williams, J.H., Coley, H.L., Ray, M.N., Ford, D.E., Allison, J.J. & Houston, T.K. (2011). Development of an interactive, web-delivered system to increase provider-patient engagement in smoking cessation. <i>Journal of Medical Internet Research</i> , 13 (4), 146-157.	Outside scope.
62	Santos, P. (2007). SCRUM meets CMMi: Agility and discipline combined. <i>Dr.Dobb's Journal</i> , 32 (9), 28-33.	Not peer-reviewed.
63	Sao Jose, d.F., Yamanaka, K. & do, A.T. (2010). Extreme learning of programming - a methodology based on extreme programming for programming teaching-learning. <i>INFOCOMP Journal of Computer Science</i> , 9 (3), 76-85.	Outside scope (teaching methods).
64	Sewchurran, K. (2008). Toward an approach to create self-organizing and reflexive information systems project practitioners. <i>International Journal of Managing Projects in Business</i> , 1 (3), 316-33.	Outside scope (teaching methods). No motivation theory.
65	Shin, J., Lee, K., Yener, A. & La Porta, T.F. (2006). On-demand diversity wireless relay networks. <i>Mobile Networks and Applications</i> , 11 (4), 593-611.	Outside scope.
66	Spinellis, D. (2009). Start with the most difficult part. <i>IEEE Software</i> , 26 (2), 70-71.	Not peer-reviewed.
67	Srinivasan, R., Wang, C., Ho, W.K. & Lim, K.W. (2004). Dynamic principal component analysis based methodology for clustering process states in agile chemical plants. <i>Industrial and Engineering Chemistry Research</i> , 43 (9), 2123-2139.	Outside scope.
68	Steer, D. & Doody, J.S. (2009). Dichotomies in perceived predation risk of drinking wallabies in response to predatory crocodiles. <i>Animal Behaviour</i> , 78 (5), 1071-1078.	Outside scope.
69	Swaine, M. (2008). Is your workspace informative? <i>Dr.Dobb's Journal</i> , 33 (1), 14-17.	Not peer-reviewed.
70	Tan, C. & Teo, H. (2007). Training future software developers to acquire agile development skills. <i>Communications of the ACM</i> , 50 (12), 97-98.	Outside scope (teaching methods)

71	Tang, C. & Tomlin, B. (2008). The power of flexibility for mitigating supply chain risks. <i>International Journal of Production Economics</i> , 116 (1), 12-27.	Outside scope.
72	Wadhwa, S. & Chopra, A. (2000). A genetic algorithm application: Dynamic re-configuration in agile manufacturing systems. <i>Studies in Informatics and Control</i> , 9 (4), 285-301.	Outside scope.
73	Wallauer, J., Macedo, D., Andrade, R. & von Wangenheim, A. (2008). Building a national telemedicine network. <i>IT Professional</i> , 10 (2), 12-17.	Outside scope.
74	van Winkelen, C. & McKenzie, J. (2009). Using scenarios to explore the potential for shifts in the relative priority of human, structural and relational capital in generating value. <i>Electronic Journal of Knowledge Management</i> , 7 (4), 509-16.	Outside scope.
75	Vinke, C.M. & Schoemaker, N.J. (2012). The welfare of ferrets (<i>Mustela putorius furo</i>): A review on the housing and management of pet ferrets. <i>Applied Animal Behaviour Science</i> , 139 (3-4), 155-168.	Outside scope.
76	Xu, H., Li, J. & Zhao, C. (2005). Design and experiment of double foot liner ultrasonic motor. <i>Zhongguo Jixie Gongcheng/China Mechanical Engineering</i> , 16 (3), 243-245.	Outside scope.
77	Xu, H. & Zhao, C. (2007). Structure of double feet liner ultrasonic motor and its modal experiment. <i>Zhendong yu Chongji/Journal of Vibration and Shock</i> , 26 (6), 100-102.	Outside scope.
78	Yang, L. & Giannakis, G.B. (2006). Crossband flexible UWB multiple access for high-rate multipiconet WPANs. <i>IEEE Transactions on Communications</i> , 54 (11), 2023-32.	Outside scope.
79	Zeichen, G., Zoitl, A. & Prenninger, H. (2008). System technologies for production systems. <i>ZWF Zeitschrift fuer Wirtschaftlichen Fabrikbetrieb</i> , 103 (9), 589-593.	Outside scope.
80	Zhou Shao-ping, Qun, L. & Wang Wei-ping (2007). Exploratory analysis framework research for weapon system of systems evaluation. <i>Journal of System Simulation</i> , 19 (9), 2066-2069.	Outside scope.

Appendix B.**Bibliographic data for articles eliminated in step 3b**

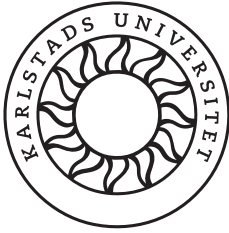
#	Article	Comments and reason for exclusion
81	Arun, N., Coyle, P.T. & Hauenstein, N. (2012). Learning agility: Still searching for clarity on a confounded construct. <i>Industrial and Organizational Psychology: Perspectives on Science and Practice</i> , 5 (3), 290-293.	Opinion paper. Discusses "learning agility" as a construct.. Not related to ISD. >>>> E) Wrong subject area.
82	Dawande, M., Kumar, S., Mookerjee, V. & Srisankarajah, C. (2008). Maximum commonality problems: Applications and analysis. <i>Management Science</i> , 54 (1), 194-207.	Describes a mathematical model for the optimization of pair-programming. "...an algorithmic analysis of developer assignments in pair programming" >>>> C) No motivation theory theory.
83	De Carvalho, B.V. & Mello, C.H.P. (2012). Implementation of scrum agile methodology in software product project in a small technology-based company. <i>Gestao e Producao</i> , 19 (3), 557-573.	Spanish. Only the abstract is in English >>>> D) Not English
84	Eaton, M. (2003). Running the lean/agile marathon [lean/agile improvement programmes]. <i>Manufacturing Engineer</i> , 82 (6), 14-17.	>>>> A) Not peer-reviewed.
85	Fairley, R.E. & Willshire, M.J. (2005). Iterative rework: The good, the bad, and the ugly. <i>Computer</i> , 38 (9), 34-41.	Proposal of solution. How to improve processes to affect the amount of rework to be sufficient but not inefficient. Conceptual only, relying on literature. >>>> C) No motivation theory.
86	Hilkka, M.R., Tuure, T. & Matti, R. (2005). Is extreme programming just old wine in new bottles: A comparison of two cases. <i>Journal of Database Management</i> , 16 (4), 41-61.	Philosophical/Opinion (argues that XP is a collection of old practices). Multiple case study. >>>> B) No theory applied.
87	Layman, L., Williams, L. & Cunningham, L. (2006). Motivations and measurements in an agile case study. <i>Journal of Systems Architecture</i> , 52 (11), 654-667.	Evaluation. Case (1). XP. Assess business results. Create XP evaluation framework. (Discuss problems obtaining measurements without disturbing the assessed teams.) [Extra comments: Case stud: One SW development project. Use of XP and opportunities/problems related to this, discussed systematically. Well presented. But the article is focused on how to apply a case study research design to evaluate a work process (such as XP). My reflection is that the research started as an evaluation of XP, but the article was then refocused in the final direction when the research methodological difficulties did grow. The value of the article lies both in the methodological discussions (on how to do research in a "live setting") and in the choice of aspects for observation and evaluation of XP.] >>>> C) No motivation theory.
88	McMahon, P.E. (2006). Lessons learned using agile methods on large defense contracts. <i>CrossTalk</i> , 19 (5), 25-30.	Agile methods in large defense industry projects. >>>> A) Not peer-reviewed.
89	McManus, J. (2003). Team agility. <i>Computer Bulletin (London, 1986)</i> , 45 (5), 26-27.	>>>> A) Not peer-reviewed.
90	Parast, M.M. & Adams, S. (2004). Team-based rewards. <i>Engineering Management</i> , 14 (2), 12-13.	Not a research article. >>>> A) Not peer-reviewed
91	Woodward, E.V., Bowers, R., Thio, V.S., Johnson, K., Srihari, M. & Bracht, C.J. (2010). Agile methods for software practice transformation. <i>IBM Journal of Research and Development</i> , 54 (2),.	No access to the article. Assessed based on abstract. Presents and argue for a method to implement Scrum in an organization. >>>> C) No motivation theory.

Appendix C.**Bibliographic data for articles eliminated in step 3c and the remaining, relevant article**

#	Article	Comments and reason for exclusion (if applicable)
92	Conboy, K., Coyle, S., Wang, X. & Pikkarainen, M. (2011). People over process: Key challenges in agile development. <i>IEEE Software</i> , 28 (4), 48-57.	Evaluation. Multiple case studies. Soft factors. Nine soft/people areas identified and commented on. >>>> Motivation theory not explicit. Eliminated.
93	Paasivaara, M., Durasiewicz, S. & Lassenius, C. (2008). Using scrum in a globally distributed project: A case study. <i>Software Process Improvement and Practice</i> , 13 (6), 527-544.	Evaluation research. Global SW development. Case study. Scrum. "Participants expressed that the methods applied were satisfying." >>>> No specific theory applied for evaluation of effects. Eliminated.
94	Salo, O. & Abrahamsson, P. (2007). An iterative improvement process for agile software development. <i>Software Process Improvement and Practice</i> , 12 (1), 81-100.	Evaluation proposal. Multiple case study (in a controlled setting). Quantitative measures during the cases + qualitative (interviews). Results in form of measured improvements and expressed satisfaction. Underlying processes explaining the observed effect not analyzed. Tested process: Post-Iteration Workshop. >>>> No explicit motivation theory applied. Eliminated.
95	McHugh, O., Conboy, K. & Lang, M. (2011). Using agile practices to influence motivation within IT project teams. <i>Scandinavian Journal of Information Systems</i> , 23 (2), 59-84.	Evaluation. Case study (2). Interviews. Scrum (Iteration planning, daily stand-up, iteration retrospective). Using the Beecham et al. motivation model for SW developers as the underlying theory. Partly overlapping constructs from SDT and from Amabile, but adds several own motivational constructs. Motivation factors and demotivation factors are put into separated categories. Method for interviewing seems to be inspired by Herzberg's method from 1958. >>>> The article is relevant.

Appendix D.
Search strings and number of hits per database

Database	No. of articles	Search string(s)
Scopus	24	TITLE-ABS-KEY(agile AND motivation) Limit to: Journals
ACM Digital Library	5 (50, incl. conference papers. Conference papers were however not exported.)	(((((Abstract:agile and Abstract:motivation)) or (Title:agile and Title:motivation))) or (Keywords:agile AND Keywords:motivation))
IEEE Xplore Digital Library	4	You searched for: (("Document Title":agile motivation) OR "Abstract":agile motivation) OR "Author Keywords":agile motivation) You Refined by: Content Type: Journals & Magazines
AIS Electronic Library	Five search strings were tested and used: Search #1: 1 result Search #2: 1 result (1 duplicate) Search #3: 47 results (1 duplicate), Reading through list assessing relevance from titles (and checking abstracts when in doubt), confirmed the initial search result of 1 result (from search #1). Search #4: 18 results (1 duplicate), Reading through list assessing relevance from titles (and checking abstracts when in doubt), confirmed the initial search result of 1 result (from search #1). Search #5: 146 results (incl. all types of texts); reduced to 52 results when restricted to journals; No additional texts found. Total number of texts identified from all 5 searches: 1	1: Abstract: (agile) AND Abstract: (motivation) Peer-reviewed only 2: Title: (agile) AND Title: (motivation) Peer-reviewed only 3: Abstract: (agile) OR Abstract: (motivation) Peer-reviewed only 4: Title: (agile) OR Title: (motivation) Peer-reviewed only 5: All fields: (agile) AND All fields: (motivation) Peer-reviewed only
Engineering Village	113	Compendex & Inspec for 1999-2013: (((agile) WN KY) AND ((motivation) WN KY)), Journal article only. (Time span introduced, since this reduced the hits from 127 to 113. Brief inspection of the excluded texts (by Titles) confirmed these were not relevant)
Business Source Premier	7	AB agile AND AB motivation* OR TI agile AND TI motivation* OR TI agile AND TI motivation* Peer-reviewed only
PsycINFO	4	ti(agile motivation) OR ab(agile motivation) OR if(agile motivation) Peer-reviewed only
TOTAL NUMBER OF FOUND TEXTS:		158



Motivation theory in research on agile project management