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What is project business?

Abstract

This article defines project business, and employs a bibliometric study for considering the relevant characteristics of this concept. The motivation for this study is the shallow definition of project business in contemporary project studies. Furthermore, there is no overview on such relevant academic business sources that the project business concept would be built on. The research methodology utilises a bibliometric study of the most cited business journals. The bibliometric study results in key sources that can be considered as one scientific foundation for project business. However, this research goes beyond an ordinary bibliometric study, as the key sources were read and their content was carefully analysed. In this analysis, we constructed eleven article clusters, whilst simultaneously building up an understanding of the interrelatedness between articles and article clusters. The analysis results in seven findings that explore project business. The findings indicate that there is a need for several theoretical foundations: organisation theory, innovation theories, sociological and psychometric theories. Furthermore, in the future, there may be a need for a stronger body of strategy research. The analysis results in a definition of project business. According to this definition, the unit of analysis is a firm rather than a project. The firm and its business are in a focal role, whereas projects may be secondary. The findings, project business definition, and related reasoning contribute to new knowledge about the characteristics of project business. This knowledge is also relevant for further theory building, and for developing novel managerial applications in business.

Keywords: Project business, project, business, firm

Introduction

Both project and business are important concepts. When these concepts are brought together, the following questions will become relevant: What is the role of projects in undertaking business? and: What is the role of business in undertaking projects?

Morris' [1] analysis on the evolution of project management provides an excellent understanding of different contexts where projects are conducted. Such project contexts can be considered to be representative for different businesses. This aspect brings businesses and projects together. Furthermore, Morris' study introduces different relevant lines of research that contribute to the understanding of the interrelated roles of projects and business. When modern project management began to develop, it was the efficiency rather than the effectiveness paradigm that was prevalent. Projects were used in manufacturing for seeking improved coordination. In the beginning, the managerial discipline relied mostly on administrative schemes related to purchasing, and coordinating timely interdependencies in projects and between individual projects. In today's project management literature, projects are brought to a more strategic context where dependent or independent multiple projects contribute to the fulfilment of strategic objectives in the entire business system [2, 3, 4, 5, 6].

The term project business is discussed by Cova and Holstius from a project marketing perspective. They recognise the difference in project business compared to traditional trade. [7]. The article of Skaates and Tikkanen [8] reviews the contributions of project marketing, emphasising the connection between the business relationships of individual projects and the wider environment in which these projects take place. The recent project portfolio management research line addresses the strategic management of multiple projects in business [9, 10, 11, 12, 13, 14]. This line comes from a product development context, having its theoretical background in the fields of corporate investments and corporate finance. Also criticism exists, with arguments that the management of projects is still too rigid and emphasises the original-work, coordination-oriented project management view rather than a strategic-change business perspective [15]. This implies that current management approaches may not give enough recognition to the business context of projects, such as the strategic, business cycle, or R&D [15]. Strategy is important for any business. The variety of attempts to express the specific nature of a strategy has lead different authors to create different strategic schools. One important perspective, focusing on how strategy is managed, is the process view to strategy, comprising both strategy formulation and implementation. [16, 17, 18, 19, 20, 21, 22, 23, 24, 25]. Strategy researchers have included projects and projectification in their fields of interest as part of strategy formulation and implementation [26]. Also complex product systems and their characteristics have been extensively researched [27]. The article by Söderlund [28] reviews recent articles on projects and project management published in scientific management and organisation journals, and articles in the International Journal of Project Management. Söderlund's article establishes an overview on research on different combinations of single-project and multi-project contexts, and single-firm and multi-firm contexts. Söderlund's conclusion is that the contexts of multi-projects and multi-firms are significant for the future of project research and for

practical applications. One important perspective, focusing on how strategy is managed, is the process view to strategy, comprising both strategy formulation and implementation. [16, 17, 18, 19, 20, 21, 22, 23, 24, 25]. Strategy researchers have included projects and management of multi-projects and multi-firms which are significant for the future of project research and for practical applications.

The objective of this article is to provide a definition of project business, and to introduce its relevant characteristics. Existing studies do not provide a profound definition of this important concept. Furthermore, the current knowledge does not cover extensive overviews on sources which would lay a proper foundation for the project business concept. This study aims also at providing key sources that would lay a proper foundation for the project business analysis. As the business issue is definitely the interesting part of project business, we consider briefly the *business* part of the concept in the following. The term business referred originally in the 19th century to activities or interests. Since then, it has shifted towards referring to activities of an individual commercial firm. This again links the concept of business to the theory of the firm. The theory of the firm was, in the mid-20th century, dominated by a general economist view. Later, the focus has shifted towards looking into particular issues such as processes, organisation, decision-making, and information flows within the firm context. In general, business is considered as an establishment for performing economic activities: businesses exist to produce profit. In this article, however, our basic assumption is that also non-profit organisations conduct business. In the case of non-profit organisations the ultimate objective of financial return is replaced by business objectives that relate to multifaceted benefits produced for various stakeholders. The complexity of business is further emphasised by perspectives where firms doing business are seen as coalitions of multiple, conflicting interests where rules and standards provide a degree of bounded rationality [29].

Project business is contextually linked with the business environment. It is obvious that project business evolves not only from the traditional project management discipline. A more natural assumption is that general management science may include more relevant research that contributes to the business thinking related to firms and their projects. Thus, concerning the methodology for contributing to new knowledge in this study, we focus on searching business rather than project literature.

Point of departure for bibliometric study

As our project business related interest is in projects that serve as vehicles for business, we decided to search for the essential characteristics of project business from highly regarded academic literature with true business content. For such true business content, we selected established and most cited journals that cover aspects of a firm's business in the areas of management, organisation, strategy and innovation. We selected the following journals as a point of departure for our search: Academy of Management Journal, Academy of Management Review, Administrative Science Quarterly, Strategic Management Journal, British Journal of Management, IEEE Transactions on Engineering Management, Journal of Management, Journal of Management Studies, Journal of Product Innovation Management, Management Science, Organization Science,

Organization Studies, Research Policy, R&D Management, Research Technology Management, International Journal of Technology Management, Academy of Management Executive, Harvard Business Review, and California Management Review.

In the initial phase, the search was made from ISI Web of Science for all articles (see [30]) published during 1986-2004 in those journals. The preliminary search by the term 'project business' resulted in two hits [31, 32]. There were no hits with the following search terms: project-based business, project based business, project-oriented business, project oriented business, project-based management, and project based management. As the results of these searches were not satisfactory, we ignored the results of these searches and adopted another strategy described in the following.

Procedure and data for bibliometric study

We used the journals listed above to start with our bibliometric study. The journals themselves represent what we consider essential business content. For the 'project' dimension in these journals, we searched articles that included the mere word 'project' in their title, abstract or keywords section. We found 926 such 'project' articles in these journals from ISI Web of Science, published during 1986-2004. The number of these 926 [citing] articles by publication year is shown in Figure 1. As we did the database search in early autumn, 2004, the number of citing articles for the year 2004 does represent only those articles accumulated to the database at that point of time. The total number of source references of these 926 citing articles was 45 307. This number (45 307) was obtained by simply summing up all source references from the list of references of the 926 citing articles. However, as the referenced sources include many same sources cited from several of the 926 citing articles, the total number of different [referred] articles was only 3 863.

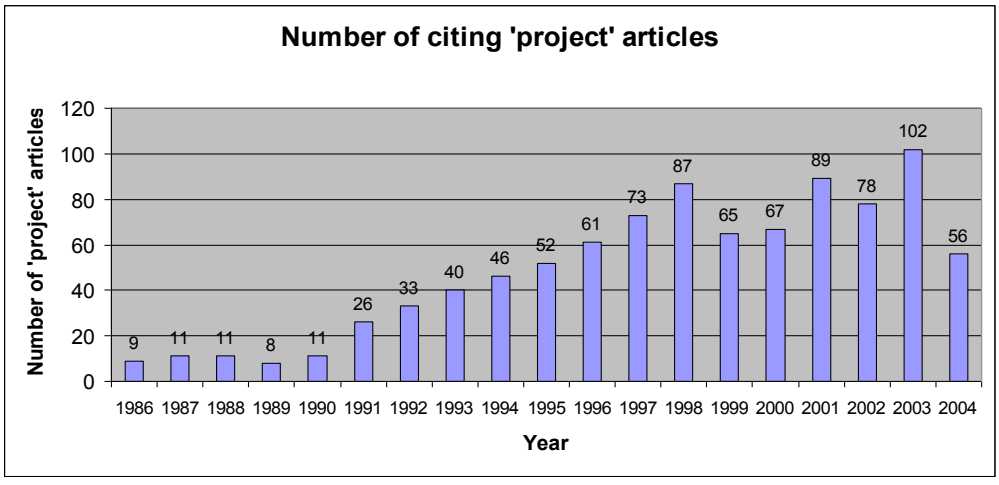

Figure 1. Number of citing 'project' articles by publication year

In our analysis, we are interested in finding key sources and origins of project business, or, 'projects' and 'business'. This justifies our approach not to analyse the 926 citing articles that may be considered as more contemporary, but rather to analyse the 3 863

referred articles. This is for identifying the important references, their relevant contents, and their potential interrelatedness. Figure 2 shows those 42 referred articles of the 3 863, which received a minimum of 25 citations from the 926 citing articles. In the figure, a circle depicts each referred article, and the area of each circle is proportional to the number of citations received. A line connecting two circles [referred articles] indicates that the two articles are referred to from one same citing article. The thicker the line the more are the citing articles that cite to the two referred articles. The methodology used for this analysis is the following. The searched articles are imported from ISI Web of Science to SITKIS software [33] that prepares the data for the UCINET network analysis program [34] and for desktop office programs for further analyses. Figure 2 is produced by UCINET.

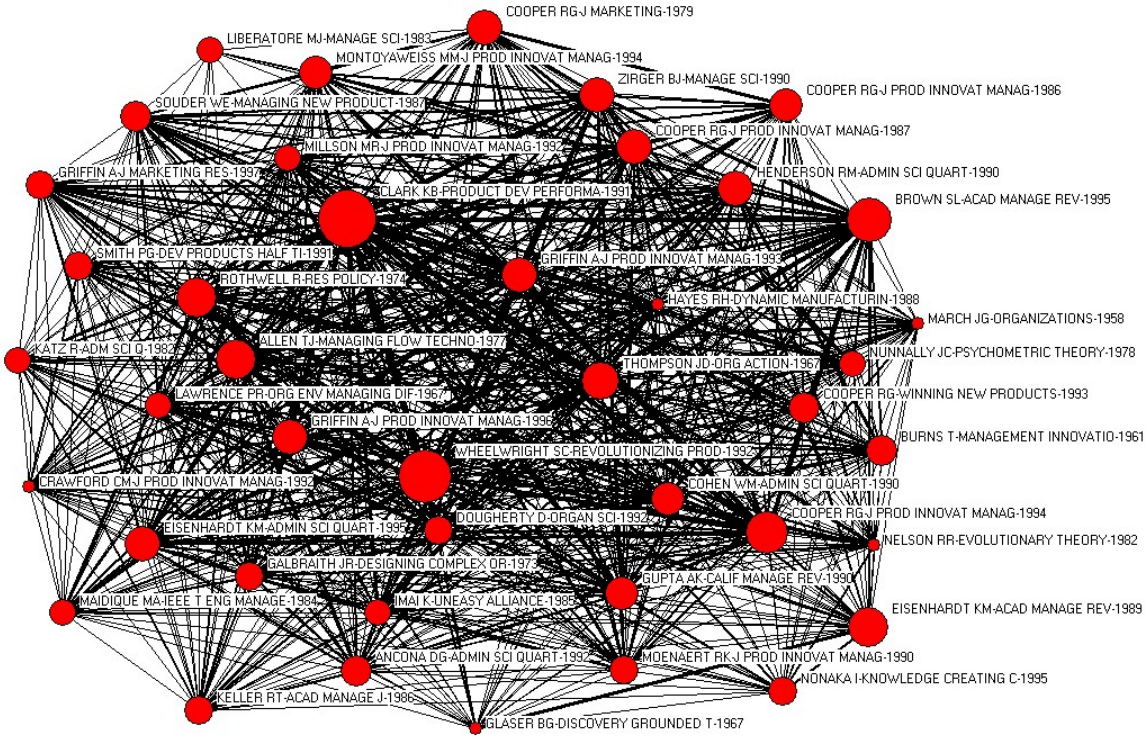

Figure 2. Referred articles with minimum of 25 citations from citing articles

The 42 referred articles in Figure 2 represent key sources that are a focal point in our analysis. The 42 referred articles are listed in the references of this paper, from [35] to [76]. The articles are arranged in order of importance, in terms of the number of citations received. For example, the book by Clark and Fujimoto [35] received 104 citations, while the article by Crawford [76] received 25 citations. There are altogether 1 621 citations to the 42 key sources. Figure 3 shows the number of the 1 621 citations by citing year.

Figure 4 shows the 1 621 citations as allocated to five-year intervals of publishing years of the referred articles. This way, Figure 4 highlights the years of publication of important key sources. The peak in the early 1990's – and around it – is mostly due to several publications addressing the product development and innovation area. This reflects the paradigm shift towards seeking effectiveness and efficiency from

technological development through enhanced R&D activities. Another simultaneous rather significant line of research in the key sources at that time is organisational knowledge and learning. Concerning the early key sources in the 1950's and 1960's indicated by Figure 4, it seems that early organisation theory books built an important foundation. Such organisation theory books at that time are March 1958 [68] with 27 citations, Thompson 1967 [41] with 49 citations, and Lawrence and Lorsch 1967 [63] with 29 citations. Burns and Stalker 1961 [59] with 34 citations represent early innovation management research already at that time, and Glaser and Strauss 1967 [55] with 36 citations focuses on grounded theory building approach for sociological theory building.

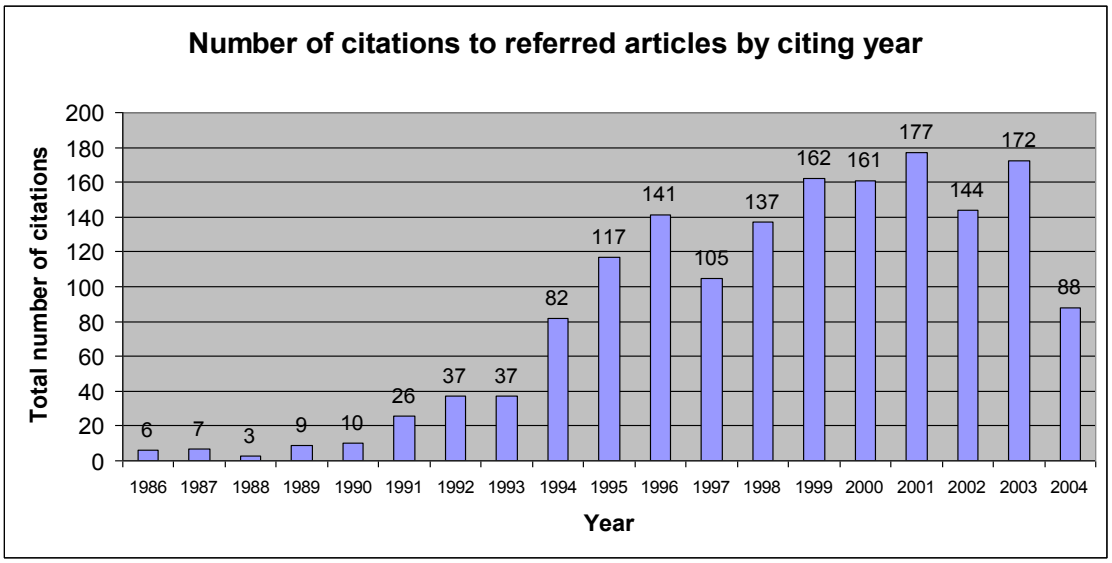

Figure 3. Citations to referred articles by the citing year of citing articles

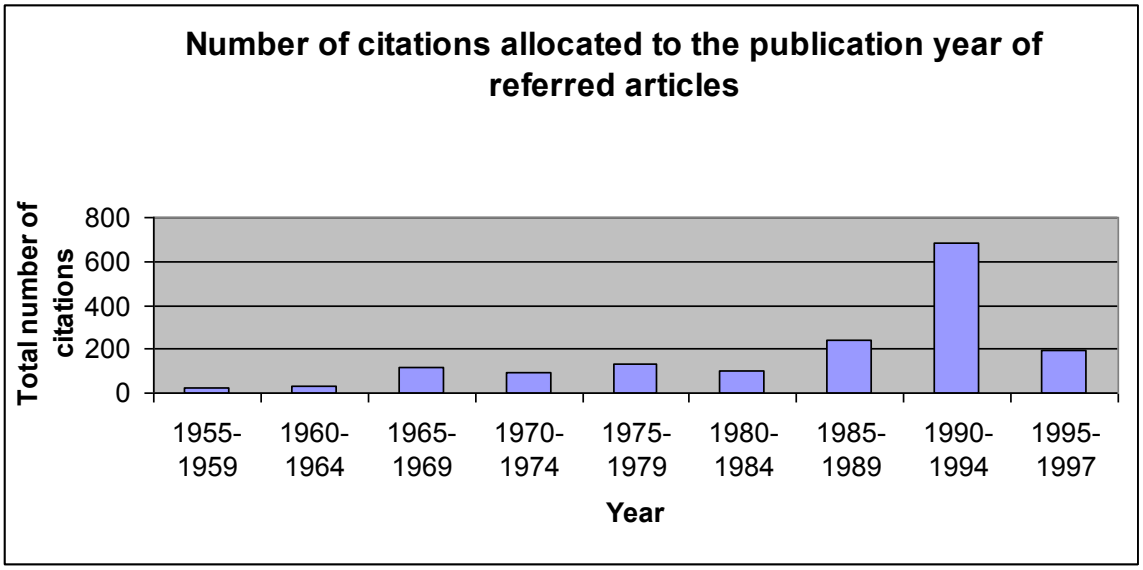

Figure 4. Citations to referred articles by publication year of referred articles

Analysis of key sources

In fact, we did not obtain much from trying to understand the potential clusters of publications, their interrelations, and respective implications from the pure bibliometric data with various numerical and graphical illustrations from our databases (Figure 2 is one example of such illustration). Instead, we analysed the 42 referred articles – or key sources – by reading them through, by simultaneously writing qualitative analyses for each article. When doing so, we ended up forming eleven article clusters by the themes, topical contents, and the approaches of the articles. After forming the clusters, we categorised the clusters into three areas. The three areas represent clusters with process, organisation, and technological and sociological change issues. The clusters and areas are shown in Table 1, and each cluster is briefly analysed in the following. In describing the clusters, references to the sources belonging to each cluster are listed in order of descending number of citations in the beginning of the cluster description.

Table 1. Article clusters for key sources

Area	Cluster no.	Cluster title	Number of sources in the cluster	Total number of citations
Process	1	Product development success and process	10	402
	2	Accelerating new product development	7	236
	3	Manufacturing performance, and development in industry	2	130
	4	Organising for R&D and comprehensive management approaches	2	119
	5	Multi-project management	1	26
Organization	6	Organisation theory and organisational design	5	188
	7	Organisational knowledge accumulation, transfer, and learning	5	175
	8	Marketing-R&D interface	3	108
	9	Inter-organisational collaboration	3	106
Technological and sociological change	10	Sociological and psychometric theories, and theory building	2	71
	11	Technological and economic change	2	61

1. Product development success and process. The sources in this cluster are [37, 39, 42, 43, 44, 54, 57, 58, 67, 75]. This cluster includes studies that mostly focus on success factors and the related features of activities/processes in a firm to enhance successful management of new product development. Six studies are rather focused upon the success factors of new product development. Two publications introduce what they call third-generation new product development (NPD) processes, or novel NPD processes [39, 58]. One paper emphasises metrics and measurement [67]. Although five success factor studies recognise the factors as determinants for also unsuccessful outcomes, only

one success factor study focuses in a rather explicit way also on failure factors [42]. One paper referred especially to product rather than project success [44], thus emphasising the relevant aspect in all papers: the project must be managed by external factors such as characteristics of the product and competitive environment. This way, the papers departed from the traditional aspect of considering the management of projects to be characterised by rational task planning approaches. The sources in this cluster are published between 1984 and 1995, with most studies published in early 1990's. However, the innovation success factors and failure factors study by Rothwell et al. 1974 [42] is the only exception that departs from this time window. Furthermore, the Rothwell et al. study is a critical and thorough study that employs a paired comparison research technique for the empirical study. In this respect, Rothwell et al.'s study resembles the study reported by Lawrence and Lorsch [63] in cluster no. 6. The results of these two studies are rather similar in many respects, despite different terminology and concepts. Rothwell et al emphasise the user need [42].

2. Accelerating new product development. The sources in this cluster are [45, 46, 51, 60, 66, 72, 76]. The articles in this cluster focus on shortening the product development cycle, mostly for technology-based firms. Eisenhardt's paper from 1995 also emphasises adaptiveness by expanding from the rational process thinking towards environment-dependency [46]. Eisenhardt's paper also shows differences of effective approaches, depending on the maturity of the industrial segment.

3. Manufacturing performance, and development in industry. This cluster includes only two sources [35, 74]. The publications in this cluster adopt a viewpoint of strategic development of manufacturing in entire industries towards what can be considered as a new paradigm. The Clark and Fujimoto book from 1991 received highest rank due to its 104 citations [35]. The book is about the development of products in the world automobile industry, with several comparisons between the USA, Europe and Japan. The book adopts a strategic view by looking at product development performance in the industrial context of a whole industry, and organising for lead times, productivity and quality. The book also discusses the importance of project strategy, which departs from traditional project management towards a more business-orientated view. The book by Hayes, Wheelwright and Clark from 1988 is about a new manufacturing paradigm i.e., about matching manufacturing to new contemporary performance requirements. However, the role of projects in this book is not extensive: projects are discussed briefly as developmental schemes, by concentrating on the challenges of organising projects across the functions and activities of the manufacturing organization. [74].

4. Organising for R&D and comprehensive management approaches. This cluster also includes only two sources [36, 53]. The books in this cluster represented an exceptionally comprehensive management approach and/or mature and critical analysis on how managing R&D in organisations could be conducted. Wheelwright and Clark 1992 report that the book is built on seven years of extensive research conducted by the authors and Souder's book of 1987 is built on a basis of a ten-year research period. The Wheelwright and Clark book from 1992 had a second rank out of all by 82 received citations [36]. The focus is on the development of new products and processes in a firm. The aggregate

project plan approach emphasises the simultaneous strategic management of multiple different projects and project types. The link between strategy and development projects is an important issue. Furthermore, organising issues of teams (authority, responsibility, roles) are analysed, and the concept of project strategy is introduced. The project strategy was also discussed in [35] in cluster no. 3. Souder's book of 1987 introduces various important aspects on organising for and managing new product innovations in firms. The book provides conceptual and practical organisational managerial schemes with an understanding of the effectiveness of these in different environments and situations. [53]

5. Multi-project management. The Liberatore and Titus study from 1983 is the only study in this cluster [71]. The study analyses R&D multi-project decision making in firms, and the impact of quantitative decision-making/selection and project management techniques. Indeed, this can be considered as an early 'portfolio management' study, with some emphasis also on single project management integration to upper level management, and vice versa. Of course, management of multiple projects is discussed in other sources in other clusters, for instance, with the aggregate project plan theme of Wheelwright and Clark 1992 in cluster no. 4. [36]. However, the Liberatore and Titus study was the only one that is focused on this theme only.

6. Organisation theory and organisational design. The sources in this cluster are [41, 47, 48, 63, 68]. Excepting one article from the 90's, all publications in this category are organisation theory books from 50's, 60's and 70's. Thompson's book of 1967 adopts an open-system approach for understanding an organisations' activities; uncertainty is an important concept. [41]. Galbraith's book of 1973 focuses on matrix structures; organisations are considered as information-processing networks, where uncertainty is a major determinant for organising information processing and organisation structure [47]. The paper of Henderson and Clark from 1990 focuses on architectural innovation with an integrating view between organisation, product, and knowledge [48]. The book of Lawrence and Lorsch from 1967 focuses on environment dependency in organising. The basic message is that there is not one single best way to manage and organise in all situations, and there must be fit between an organisation and its environment. Different states of differentiation and integration in organisational systems are important for different ways of organising. Lawrence and Lorsch suggest contingency theory [63]. This study resembles Rothwell et al.'s study in cluster no. 1 [42]. March's book of 1958 is about the theory of formal organisations. The focus is on decisions and information flows rather than hierarchy [68].

7. Organisational knowledge accumulation, transfer, and learning. The sources in this cluster are [38, 52, 62, 64, 73]. These studies include sociological study on knowledge flow and communication networks [38], R&D's contribution to knowledge and capacity/competence [52], learning and knowledge transfer [62], internal knowledge sharing and learning schemes in product innovation [64], and Japanese approach to NPD organising and learning [73].

8. Marketing-R&D interface. The three papers in this cluster suggest the need for greater marketing orientation [49], analyse the marketing and R&D interface by using a causal

map that illustrates the integrative factors/activities between these functions [50], and introduce a nomological network that illustrates the integrative mechanisms and information transfer mechanisms between marketing and R&D functions [65].

9. Inter-organisational collaboration. The three papers in this cluster are [40, 61, 70]. The Eisenhardt 1989 paper provides an analysis of agency theory, and its application to inter-organisational activities, collaboration and contractual settings [40]. The principal recommendation is to incorporate an agency perspective in studies of the many problems having a cooperative structure. There is support for agency theory, linking contract form with information systems, outcome uncertainty, incentives, and risk. Eisenhardt's study relates also to the theme or organisational theory of cluster no. 6. Ancona and Caldwell's paper from 1992 analyses new-product teams' external communication and vertical and horizontal communication in high-technology companies [61]. The Katz paper from 1982 analyses R&D project teams' communication behaviours by the tenure composition of project groups [70].

10. Sociological and psychometric theories, and theory building. The Glaser and Strauss book from 1967 introduces a sociological theory building perspective. It emphasises theory building by using a grounded theory approach for generating theory from qualitative data. Grounded theory is considered as a process of comparative analysis, rather than positioning the theory building on logical deduction from a priori assumptions [55]. This psychometric theory book of Nunnally and Bernstein from 1978 is a comprehensive text on measurement problems in psychology and in areas of business. The broad areas covered are scaling and classification [56].

11. Technological and economic change. The two books in this technological and economic change cluster relate to the organisational theory cluster no. 4 and sociological and psychometric theory-building cluster no. 10. The book of Burns and Stalker from 1961 analyses the technological change and organisational issues of a company that relates to the technological system supporting and being supported by industry [59]. Furthermore, the book analyses the adaptation of relationships between individuals towards the requirements of the technical and commercial tasks of the firm. Organic systems are those, which are best adapted to conditions of change. The book discusses management structures and systems, organisation as an interpretive system, mechanistic and organic systems of management, working organisation, political system, and status structure within the concern, among others. The methods of the study are those common to what is called field sociology and to social anthropology. The book of Nelson and Winter of 1982 represents an organisation-theoretic viewpoint for addressing processes of long-run economic development [69]. Technological change is one key driving force in this. The book employs an evolutionary theory approach. Skills as an evolutionary issue are discussed by unfolding the themes of skills as programs, skills and tacit knowing, skills and choices, the uses of skill names, ambiguity of scope, and the skills of the businessman. Organisational capabilities and behaviour discussion includes the following themes: routine as organisational memory; routine as truce; routine as target (control, replication, contraction, and imitation); routines and skills as parallels; optimal routines and optimisation routines; routines, heuristics, and innovation; and routines and genes.

Conclusions – What is project business?

Our analysis strengthens the view that projects are part of overall business and a central part of the development, strategic sight and maintaining of the firm's competitiveness. Our key source analysis of 42 key sources and 11 clusters ended up with seven main findings (a) – (g). The findings are summarised in Table 2. In the table, and in the following reasoning, the findings are analysed in terms of their scientific and managerial implications.

(a) **The dominant role of R&D**. The R&D and innovation context was dominant in our analysis. A large part of the discussion in the key sources related to various R&D related business processes. Some studies provided insight on successful product structures for meeting market needs. Our conclusion is that innovation management is an important theoretical body of knowledge. From the practical application viewpoint, we conclude that project business in industry may be focused on business renewal.

(b) **No operations management content**. There were no sources that would have discussed projects as manufacturing vehicles in a firm's production line. Thus, the conclusion is that established and most cited business journals do not use sources with project delivery business content. This may also indicate that projectised deliveries of systems, problem solving, consultancy, or services, do not have a significant role in industry. We conclude that articles employing scientific knowledge on project delivery business are presented elsewhere. To our knowledge, such other publications are operations management, logistics and supply chain management, project management, and marketing journals.

(c) **Scarce representation of strategy research**. Sources were rather scarce which would have represented the strategy line of research. Concerning this finding, our experience is, indeed, that the strategy literature does not refer much to the project concept. Strategy was present in many innovation-oriented key sources as a managerial issue to be integrated in the overall management scheme while running R&D projects, but, however, the strategy discussion in the key sources as a whole did not represent any strong indication towards strategy research. In our view, projects are vehicles for implementing or introducing strategies, which would emphasise the need in the future for a stronger body of strategy research addressing the project business issue.

(d) **Environment-dependent approaches**. Many approaches and suggestions relied on environment-dependence. This means that approaches were suggested that would be adjustable to the application environment. Furthermore, many suggested approaches enhance flexibility and adaptiveness to the business environment while in use. All this takes distance from the traditional project management approach of relying on the rational plan. This also takes distance from traditional project management by expanding the managerial focus from internal project management processes towards focusing on adapting to external business environments. Our conclusion is that the project management line of research represents a too rigid and narrow closed system view, and

therefore it does not emphasise the management of business in relation to its environment. In practical applications there is a need to match the management approach to the environment. Furthermore, flexible and adaptive approaches have an important role. This enhances the management of business rather than management of mere projects.

(e) **Need for several theoretical foundations**. Management of projects in firms is a complex phenomenon and there is a need for several theoretical foundations: organisation theory, innovation theories, sociological and psychometric theories. Practical applications require cross-disciplinary views for their development. This implies challenging requirements also for scientific work: to be effective, methodological schemes for further knowledge creation must employ cross-disciplinary research approaches.

(f) **The firm from organisation theory viewpoint**. The organisation theory sources and their themes suggest that there are strong theoretical foundations for understanding activities of a firm that uses projects for achieving its business objectives. The implication is that in theoretical research settings an appropriate unit of analysis is a firm rather than a project. The organisation theory key sources emphasise an open-system approach in relation to the organisation's environment, internal and external sources for uncertainty, information processing, and organisational structures such as matrix structures. The important issue to consider in defining project business is that organisations – or firms – have objectives, and therefore, the organisation or organisations together conduct something that is considered as business. However, the objectives of the organisation may be expressed explicitly, or they may be contained in more implicitly expressed purposes, directions, or values.

(g) **Inter-organisational collaboration**. The theme of inter-organisational collaboration arises from the sources. Such collaboration relates to contracts and information systems between organisations, and also to the theme of external communication. The important role of business-driven projects in technological and economic change at the level of whole industries suggests that management of networked business environment is important. Furthermore, knowledge transfer and learning were emphasised in relation to R&D activities, but also as a general project business issue.

Table 2. Findings from the analysis of key sources

Nr.	Finding	Scientific implication	Managerial implication
(a)	The dominant role of R&D	Innovation management is an important theoretical body of knowledge.	Empirical application of projects in business may be focused on business renewal.
(b)	No operations management content	The discussion and theoretical views on projects as manufacturing devices is scarce in the most cited academic articles.	It can be that management of delivery projects in business is not an extensive application area in industry.
(c)	Scarce representation of strategy research	The existing strategy research does not contribute to project business. In the future, there may be a need for a stronger body of strategy research.	However, strategy and strategic management are important in practical applications.
(d)	Environment-dependent approaches	Project management body of knowledge represents too rigid and narrow closed system view, and therefore it does not emphasise the management of business in relation to its environment.	There is a need to match the management approach to the environment. Furthermore, flexible and adaptive approaches have an important role. This enhances the management of business rather than management of mere projects.
(e)	Need for several theoretical foundations	Organisation theory, innovation theories, sociological and psychometric theories are important for further theory building.	The empirical phenomenon is complex. The understanding of the phenomenon requires cross-disciplinary views.
(f)	The firm from organisation theory viewpoint	Organisation theory provides a strong theoretical foundation for understanding activities of a firm that uses projects for achieving its business objectives. The unit of analysis is a firm rather than a project.	The firm and its business are in a focal role, while projects may be secondary.
(g)	Inter-organisational collaboration	Management of networks, contracts, information and knowledge are relevant issues for theoretical considerations.	Business networks and inter-organisational collaboration between projects and firms are important.

Our analysis indicated several scientific and managerial implications that should be covered in the understanding and defining of project business. There are indications about the important linkage between R&D processes, strategy and objectives. Both organisational and management considerations in project business are linked to the firm, its business, and environment. A need for adaptiveness in processes and actions links project business to a general need for cross-disciplinary and in-depth understanding of the business as a large area. This has also an impact on practical capability requirements among projects' key stakeholders.

From the analysis above, we can find three important concepts that will be important in the definition of project business: 'part of business', 'objectives', and 'firm'. Concerning Table 1, we see that the article clusters in the *process* area relate mostly to 'part of business' concept, the *technological and sociological change* area relates to the 'objectives' concept, and *organisation* area relates to the 'firm' concept. Also, all seven findings in Table 2 provide us with a deeper insight for the definition and characteristics of project business. Thus, the seven main findings (a) – (g) reported above could also be linked in a similar manner [as we did with the three areas above] to the three important concepts in the project business definition. However, the links are not straightforward one-to-one links between one finding and one concept. For example, the finding (a) about the dominant role of R&D and innovation context relates both to 'objectives' (for the inherent choice of the developmental focus) and to 'the part of business' (for its specific application content issue). As the connections of the findings (a) - (g) to the concepts in the project business definition are rather complex; we exclude the specific reasoning of all connections in this article. Instead, we will restrict the discussion to the following few notions related to the 'firm' concept. The firm and its business are emphasised in finding (f), but, however, the finding (f) and findings (g) and (d) also address the importance of the firm's environment and the inter-organisational collaboration between firms. This indicates the fact that there are several firms with simultaneous and interconnected business, which often means that project business could also be viewed in a context of several firms. Several firms together can be considered to serve as a virtual firm. The virtual firm – represented by an open business system – has its own objectives shared by interconnected firms and their actors. Finally, based on the findings and reasoning above, we define project business in the following way:

"Project business is the part of business that relates directly or indirectly to projects, with a purpose to achieve objectives of a firm or several firms."

Further research on project business

Project business is an evolving area both from a scientific and managerial point of view. Our definition of project business is a starting point for building practical project business applications, and a good point of departure for deepening the content of project business in further research. Our project business definition is based on seven findings that need further validation in forthcoming research. The article introduces key sources that represent one scientific foundation for project business. We welcome future studies to expand this scientific foundation.

Achievements within project management research are still a vital part in the development of project business. However, the context of project business is extensive, and therefore, there is a need for widening the theoretical and practical areas from those traditionally represented by project management research.

Organisation theory, innovation theories, sociological and psychometric theories all provide relevant theoretical foundations for the further development of project business. The theory of a firm provides one relevant and specific context. The environment is an important determinant for successful management approaches with projects. This emphasises the importance of adaptive processes and the relevance of open-system approach in organisational analysis for project business. The management of inter-organisational collaboration is relevant for projects and business activities in networks that cross organisational boundaries. Strategy is an important issue as project business relates strongly to both the firm and its objectives. In the future, there may be a need for increasing the number of project business studies that would contribute to new scientific knowledge in the strategy discipline. Areas related to the structuring of the firm's product and processes are important in the future research of project business. These relate to overall objectives and competitiveness in firms. Furthermore, the logic of value creation is one important part of future project business research.

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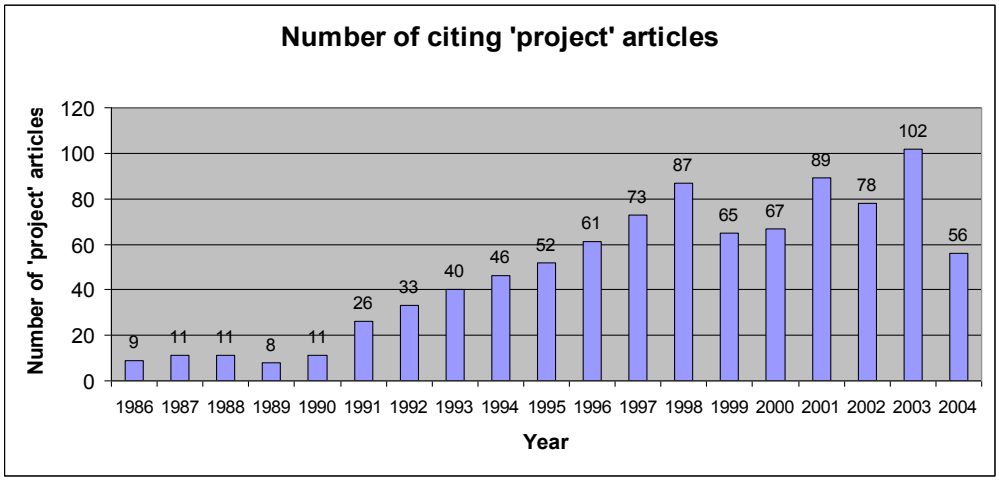

Figure 1. Number of citing 'project' articles by publication year

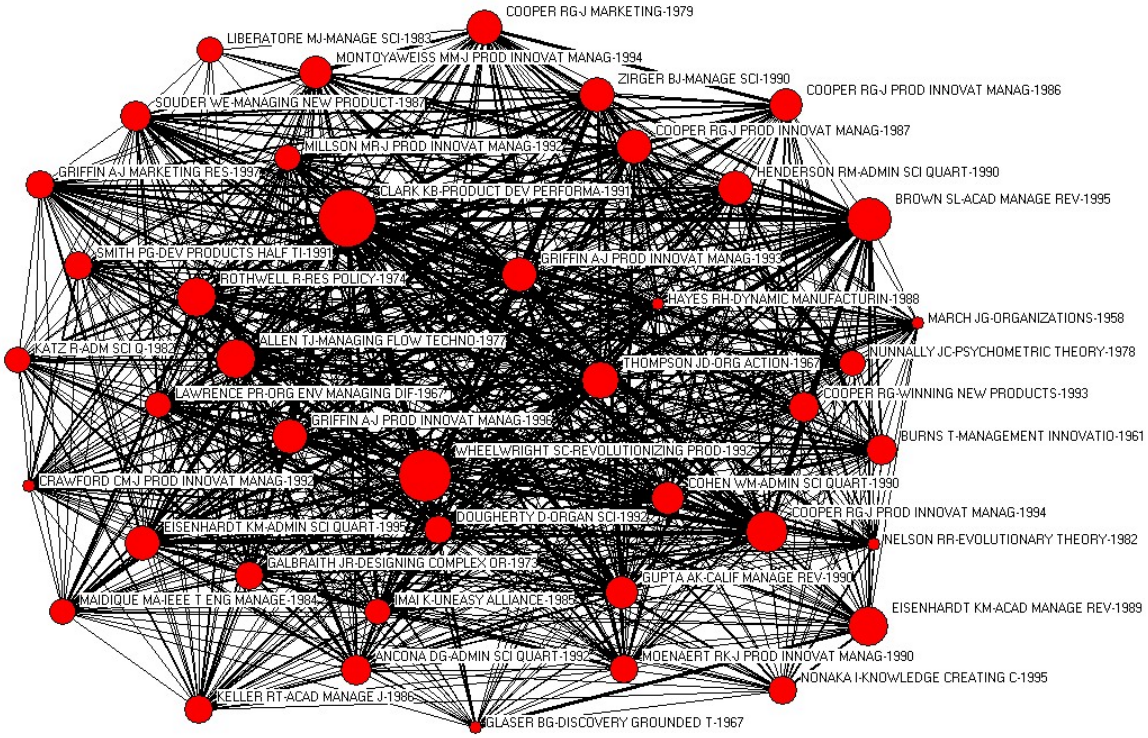

Figure 2. Referred articles with minimum of 25 citations from citing articles

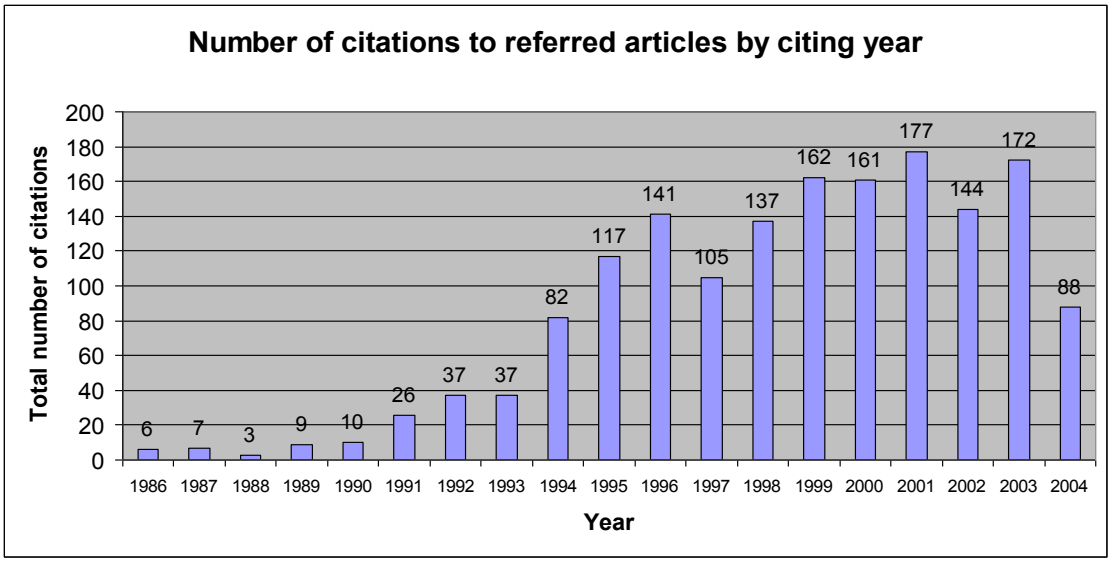

Figure 3. Citations to referred articles by the citing year of citing articles

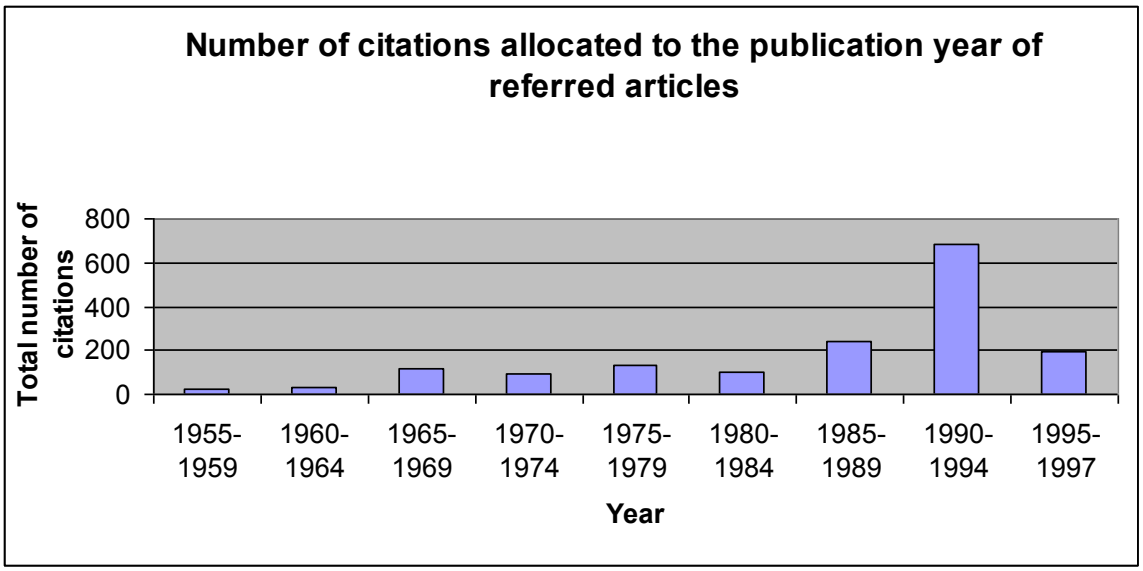

Figure 4. Citations to referred articles by publication year of referred articles

Table 1. Article clusters for key sources

Area	Cluster no.	Cluster title	Number of sources in the cluster	Total number of citations
Process	1	Product development success and process	10	402
	2	Accelerating new product development	7	236
	3	Manufacturing performance, and development in industry	2	130
	4	Organising for R&D and comprehensive management approaches	2	119
	5	Multi-project management	1	26
Organization	6	Organisation theory and organisational design	5	188
	7	Organisational knowledge accumulation, transfer, and learning	5	175
	8	Marketing-R&D interface	3	108
	9	Inter-organisational collaboration	3	106
Technological and sociological change	10	Sociological and psychometric theories, and theory building	2	71
	11	Technological and economic change	2	61

Table 2. Findings from the analysis of key sources

Nr.	Finding	Scientific implication	Managerial implication
(a)	The dominant role of R&D	Innovation management is an important theoretical body of knowledge.	Empirical application of projects in business may be focused on business renewal.
(b)	No operations management content	The discussion and theoretical views on projects as manufacturing devices is scarce in the most cited academic articles.	It can be that management of delivery projects in business is not an extensive application area in industry.
(c)	Scarce representation of strategy research	The existing strategy research does not contribute to project business. In the future, there may be a need for a stronger body of strategy research.	However, strategy and strategic management are important in practical applications.
(d)	Environment-dependent approaches	Project management body of knowledge represents too rigid and narrow closed system view, and therefore it does not emphasise the management of business in relation to its environment.	There is a need to match the management approach to the environment. Furthermore, flexible and adaptive approaches have an important role. This enhances the management of business rather than management of mere projects.
(e)	Need for several theoretical foundations	Organisation theory, innovation theories, sociological and psychometric theories are important for further theory building.	The empirical phenomenon is complex. The understanding of the phenomenon requires cross-disciplinary views.
(f)	The firm from organisation theory viewpoint	Organisation theory provides a strong theoretical foundation for understanding activities of a firm that uses projects for achieving its business objectives. The unit of analysis is a firm rather than a project.	The firm and its business are in a focal role, while projects may be secondary.
(g)	Inter-organisational collaboration	Management of networks, contracts, information and knowledge are relevant issues for theoretical considerations.	Business networks and inter-organisational collaboration between projects and firms are important.