



Strategic technology partnering: A framework extension



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ABSTRACT

For many organizations, entering into a collaborative agreement such as strategic technology partnering (STP) with other firms is considered an indispensable step toward gaining competitive advantage. Therefore, the aim of the present systematic literature review (SLR) is to synthesize and cluster prior research in a way that it can assist both academics and practitioners. I cluster the various assets of STP and propose a *THIOMP*-Framework that groups the identified assets into Technoware, Humanware, Inforware, Orgaware, Manageware, and Partnerware. The findings call for greater agreement on specific terms and concepts concerning STP assets in the academic literature. The review concludes with discussing some promising avenues for future investigation.

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1. Introduction

R&D – and consequently, technology – have enormously improved the life quality of human beings over the last half century. The days are past when companies can develop new products on their own. Firms without partnerships are becoming rarer; the modern company has multiple ties (Ettlie & Pavlou, 2006; Fey & Birkinshaw, 2005; Powell, Koput, & Smith-Doerr, 1996). Researchers and others involved in knowledge production recognize the value of external networks in the innovation process (e.g., Chesbrough, 2003; Ketchen, Ireland, & Snow, 2007). Collaboration is believed to assist with environmental uncertainty due to globalization of business activities, increased time-to-market, increased customer expectations, etc. (Dogsen, 1993; Eden, Hitt, & Ireland, 2008; Vilkamo & Keil, 2003). For firms facing fast technological changes, inter-organizational collaborations have become increasingly important for them to enhance their competitiveness (Phelps, 2010; van de Vrande, Vanhaverbeke, & Duysters, 2011). Particularly, inter-organizational partnerships are critical for firm's innovation, when firms lack sufficient internal R&D

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Table 1

Lists of the most frequently mentioned assets classified into six dimensions.

Technoware	Reference(s)	Frequency	Percentage
Cross-functional teams	Duysters, Kok, and Vaandrager (1999); Vilkamo and Keil (2003); Powell et al. (1996); Tidd (2014)	4	12.1%
Flexibility toward fast changing environment	Vilkamo and Keil (2003); Ettlie and Pavlou (2006); Bidault and Cummings (1994); Santangelo (2000); Farr and Fischer (1992)	5	15.2%
Joint technology roadmaps	Vilkamo and Keil (2003); Duysters et al. (1999); Steensma and Corley (2000); Kim and Lee (2003)	4	12.1%
Production and technological knowledge/capabilities	Lee, Lee, and Pennings (2001); Bidault and Cummings (1994); Hagedoorn and Schakenraad (1994); Lee et al. (2001)	4	12.1%
Strong patent portfolio	Fey and Birkinshaw (2005); Lee et al. (2001); Miotti and Sachwald (2003)	3	9.1%
Humanware	Reference(s)	Frequency	Percentage
Absorptive capacity/appropriation capability	Steensma and Corley (2000); Mowery et al. (1996); Duysters et al. (1999); Caloghirou, Kastelli, and Tsakanikas (2004); Schulze et al. (2014); Vilkamo and Keil (2003); Ingham and Mothe (2002)	7	11.7%
Competence-based assets (e.g. development and commercialisation skills)	Bidault and Cummings (1994); Tidd (2014); Carr (1999); Vilkamo and Keil (2003)	4	6.7%
Cohesion	Schilling and Phelps (2007); Mowery, Oxley, and Silverman (1996); Bonaccorsi and Lipparini (1994)	3	5.0%
Commitment and involvement	Saxton (1997); Vilkamo and Keil (2003); Farr and Fischer (1992); Dogsen (1993); Kim and Lee (2003); Ingham and Mothe (2002)	6	10.0%
Cooperative learning	Li, Eden, Hitt, and Ireland (2008); Santangelo (2000); Cui, Ball, and Coyne (2002); Ingham and Mothe (2002); Pennings and Harianto (1992); Hagedoorn et al. (2006)	6	10.0%
Disseminative capability	Carr (1999); Schulze et al. (2014); Kim and Lee (2003)	3	5.0%
Knowledge intensity (intellectual human capital)	Noseleit and de Faria (2013); Mukherjee, Gaur, Gaur, and Schmid (2013); Schilling and Phelps (2007); Mowery et al. (1996); Schulze et al. (2014); Rothaermel and Hess (2007)	6	10.0%
Openness to new ideas (and external organizations)	Fey and Birkinshaw (2005); Bayona, Garcia-Marco, and Huerta (2001); Chen, Chen, and Vanhaverbeke (2011)	3	5.0%
Powerful task forces (qualifications)	Powell et al. (1996); Caloghirou et al. (2004); Trott, Cordey-Hayes, and Seaton (1995); Mowery et al. (1996)	4	6.7%
Networking capabilities	Caloghirou et al. (2004); Trott et al. (1995); Pennings and Harianto (1992); Mukherjee et al. (2013); Mowery et al. (1996); Siu and Bao (2008); Vilkamo and Keil (2003); Sivasdas and Dwyer (2000)	8	13.3%
Inforware	Reference(s)	Frequency	Percentage
Open and fast communication/communication network	Häusler, Hohn and Lütz (1994); Schulze et al. (2014); Bonaccorsi and Lipparini (1994); Bidault and Cummings (1994); Bstieler and Hemmert (2008)	5	17.9%
Extensive information exchange and sharing	Bonaccorsi and Lipparini (1994); Trott et al. (1995); Kim and Lee (2003); Phene and Tallman (2010); Siu and Bao (2008); Sampson (2007)	6	21.4%
Ongoing informal and interpersonal communication	Siu and Bao (2008); Kim and Lee (2003); Trott et al. (1995); Forrest and Martin (1992)	4	14.3%
Integration of information and communication technology systems	Bonaccorsi and Lipparini (1994); Phene and Tallman (2010); Ettlie and Pavlou (2006)	3	10.7%
Proactive environmental scanning (commercial and technological)	Mowery et al. (1996); Trott et al. (1995); Mukherjee et al. (2013); Caloghirou et al. (2004); Ketchen et al. (2007)	5	17.9%
Orgaware	Reference(s)	Frequency	Percentage
Alliance portfolio diversity	Duysters et al. (1999); Ingham and Mothe (2002); Chen et al. (2011); Vilkamo and Keil (2003); Zollo et al. (2002); Noseleit and de Faria (2013)	5	5.81%
Alliance performance evaluation, feedback, monitoring, and control	Bidault and Cummings (1994); Zhou and Li (2008); Rothaermel and Hess (2007); Sivasdas and Dwyer (2000); Duysters et al. (1999); Mukherjee et al. (2013); Bonaccorsi and Lipparini (1994)	7	8.14%
Centrality-based network capabilities (e.g. regional clusters)	Tidd (2014); Hagedoorn et al. (2006); Zhang and Baden-Fuller (2010); Häusler et al. (1994); Phene and Tallman (2010); Bonaccorsi and Lipparini (1994); Zhou and Li (2008); Schilling and Phelps (2007)	8	9.30%
Coordination	Phene and Tallman (2010); Mukherjee et al. (2013); Schulze et al. (2014)	3	3.49%
Creating curricula for vocational training	Häusler et al. (1994); Caloghirou et al. (2004); Duysters et al. (1999); Cui et al. (2002)	4	4.65%
Dedicated alliance function and managers (internal accountability)	Kale and Singh (2007); Forrest and Martin (1992); Duysters et al. (1999)	3	3.49%
Financial resources	Lee et al. (2007); Phene and Tallman (2010); Ahuja (2000b)	3	3.49%
Interorganizational formalization of processes and routines	Sivasdas and Dwyer (2000); Powell et al. (1996); Zollo et al. (2002); Kim and Song (2007); Trott et al. (1995)	4	4.65%

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