

Table 1. The entrepreneurs in the study

| | Year established | Sectors | Description |
|--------|-------------------------|----------------|--|
| Dan | 2010 | IT | Dan decided to build a software company focusing on marketing analytics after working part-time during his PhD. Starting with one small project with local firms, the company currently serves several multinationals. |
| Ian | 2011 | Service | Ian worked for several large pharmaceutical companies before starting his own business. He has many years' experience working overseas with extensive knowledge and an industry network. His business focus is helping small new biotech and pharmaceutical firms launch products. His service includes coaching, market analysis, and investments. |
| George | 2009 | Manufacturing | As a part of his family business, George created his own business producing sustainable packaging for the food industry. With a loan from his family, he bought machines and built the factory on his family's land. After several years of struggling to penetrate the market, his product has started to gain recognition and he now also sells to Europe. |
| Fiona | 2010 | Service | Fiona has worked for a marketing company for several years. Fiona started a business offering consultancy support for supply chain management. Together with her partner who owns an IT firm, Fiona exploits a market niche in the energy sector. |
| Pete | 2009 | Engineering | Pete started his business to commercialise his PhD research. After successfully build a prototype. Peter attracted support from industries that provided funding and access to market. While running the business, Pete maintains his part-time position at the university. |
| Tom | 2008 | IT | After winning a new venture challenge competition at university, Tom realised his business idea after graduating. Together with several friends, Tom developed mobile apps helping users to compare prices and ease the online shopping experience. Over the years, Tom has obtained several new investments and been involved in a number of new projects. |

Table 2. Types of obstacles (using an inductive research approach)

| Respondents' comments (illustrative evidence) | First-order categories | Second-order categories | Third-order categories |
|---|--------------------------------|--------------------------------|-------------------------------|
| 'He approached me and offered his business to resell my product. Too many competitors are out there, and if you do not collaborate, you'll fail.' | Lack of market demand | Access to market and resources | Type of obstacles |
| 'One sole objective at this stage was to get next-round funding for this venture. The only way to get this funding is by developing a solid business plan and this guy has been a big help in guiding me through this process.' | Lack of investments | | |
| 'When I started with an idea, I wasn't sure at all. He gave me a boost. With his knowledge on computer coding, I became confident to move forward and invite him on-board.' | Lack of technical capabilities | Acquiring knowledge and skills | |

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| 'This guy works for the technology transfer office; he has helped me along the process, especially with patent application.' | Lack of knowledge on regulation and bureaucracy | | |
| 'I like to discuss my entire company problems with my dad. He started this business, has had a lot of experience, and he is my mentor. He has taught me everything from dealing with suppliers, my relationship with customers and employees, to finance and business strategy.' | Lack of managerial skills | Internal obstacles | Source of obstacles |
| 'He is there, because he always gives my market idea best shot. He is a natural-born salesman. His suggestion is brilliant and helps me refine my plan.' | Lack of marketing and sales skills | | |
| 'He's my former professor. He is known as an expert. I go to him for advice and discussions on future and potential new research.' | Technological uncertainty | External obstacles | |
| 'These two gave me the guidance, details, and specifications. I am a technical guy. I am not good at understanding what my clients want. I know I need to learn and am still learning.' | Difficulty in understanding customer preferences | | |
| 'He is the business guy who helped me with the project. I was a researcher at the university when I decided to start this business. I know that my product can offer a far more advanced technology than is currently on the market. However, I have no idea or clue about the market.' | Difficulty in understanding market demand | | |

Note: the interview was conducted based on the network map produced by the respondents. By pointing to each contact, we asked questions revealing the content of conversation and the role of the contacts.

Table 3. Networking approach (using an inductive research approach)

| Respondents' response (illustrative evidence) | First-order categories | Second-order categories | Third-order categories |
|--|--|--------------------------------|-------------------------------|
| 'I first met this guy when I pitched my business plan. He was interested in my proposition and was willing to help me along.' | Finding connections in events | Unplanned networking | Network expansion approach |
| 'Social places, such as a sports club, are the best places to meet people. I know him from my golf club.' | Finding contacts through social activities | | |
| 'In my opinion, LinkedIn is a powerful networking tool. I have used it a lot and met my business partners through it.' | Seeking out strangers | | |
| 'He helped me to find business partner. He is very important to us. Without him, it would have been almost impossible to get our first clients - big firms in the oil and gas industry.' | Connection through referral | Systematic networking | |
| 'I normally discuss my problem with a person that I know will solve my problem. I trust his skills. That the reason why I have him in my network.' | Expertise-based relationship | | |
| 'I don't want to waste my time. In our business, we all know who the key players are. I prefer to send an email or call them directly.' | Direct connection | | |
| 'My dad is important in refining my business ideas, | Relying on | Affinity and | Network |

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| he is very cynical and always criticises my plan. It seems there is nothing good in his eyes, but the arguments always make me rethink my plan. Definitely, I wouldn't do better business without my dad' | family | affiliation | strengthening approach |
| 'We are located in the incubator. The coffee corner is our melting pot. Although we are not in the same company, we feel that we work in the same company. We share our problems and sometimes we work in the same project.' | Proximity-based network | | |
| 'I like to meet new people. I like to attend many networking events, such as business breakfast meetings or industrial association meetings. But most of these guys I met through a long term business contact. I have worked with this guy for 20 years.' | Connection based on long-term relationships | | |
| 'He is my best friend; I met him when he was a client in my previous project, but the relationship grew. I like to talk more than business. We talk about everything from hobbies to family.' | Seeking friends not business contacts | Relational embedding | |
| 'I always involve her in many aspect of my business. She is my financial advisor, but she has also been my friend since we were young.' | Developing multiplex relationships | | |
| 'If I meet new a business contact, I always think about the potential to develop a long-term relationship. Nobody knows what will happen in the future. I might need him or he might need me.' | Developing balanced relationships | | |

Note: the interview was conducted based on the network map produced by the respondents. By pointing to each contact, we asked questions revealing the process of interaction.

Table 4. Sample characteristics

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|---|--|
| Industrial sectors | Manufacturing: 30%; Construction: 6.25%; Transport: 2.5%; Service (consultation, finance, and others): 33.75%; IT: 37.5% |
| Number of full-time employees | ≤ 10: 37.5%; 11-20: 52.5%; ≥20: 10% |
| Type of market | Domestic/local: 77.5%; International: 22.5% |
| Performance – market growth in the last two years | ≤ 10%: 36.25%; 11-25%: 48.75%; 26-50%: 11.25%; ≥ 50%: 3.75% |

Table 5. Frequency of obstacles

| | Early stage | Later stage | Total |
|--|-------------|-------------|-------|
| Lack of marketing knowledge and sales skills (A/C) | 35 | 44 | 79 |
| Lack of technological capability (A/D) | 10 | 10 | 20 |
| Lack of managerial and financial skills (A/C) | 20 | 30 | 50 |
| Lack of access to research and development facilities (A/D) | 15 | 10 | 25 |
| Lack of investments (A/D) | 20 | 10 | 30 |
| Lack of knowledge about customer demand/market (B/C) | 25 | 30 | 55 |
| Dealing with technological change (B/C) | 35 | 21 | 56 |
| Lack of market demand (B/D) | 11 | 56 | 67 |
| Dealing with the competition and industrial structure (B/C) | 12 | 15 | 27 |
| Dealing with regulations, standardisation, and bureaucracy (B/C) | 13 | 10 | 23 |

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| Total | 196 | 236 | |
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Note: The early stage is defined as the start-up/establishment stage where entrepreneurs exploited the opportunities, performed market research, and developed the product/service. Some of the entrepreneurs received support, such as from incubators, in this stage. The later stage is defined as when the product/service has entered the market. In this stage, the entrepreneurs focused on growing the business. In the study, we explained the definition of both stages and asked respondents to fill in the questionnaire while reflecting on their experiences. During the network mapping activity, we were able to confirm the obstacles and triangulate type of obstacles with the presence of network contacts.

A: internal obstacles; B: external obstacles; C: knowledge and skills; D: market and resources

Table 6. Composite reliability and correlation

| | | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|----|--------------------------------|------|------|------|------|-------|-------|-----|------|--------|------|-------|
| 1 | Number of founders | 2.34 | 0.34 | | | | | | | | | |
| 2 | Founders' business experience | 1.06 | 0.92 | .21 | | | | | | | | |
| 3 | Internal obstacles | 2.55 | 0.13 | .10 | .11 | | | | | | | |
| 4 | External obstacles | 2.85 | 0.40 | .09 | .06 | .23 | | | | | | |
| 5 | Acquiring knowledge and skills | 3.09 | 0.89 | -.23 | -.17 | .09 | .19 | | | | | |
| 6 | Accessing market and resource | 2.01 | .09 | -.06 | -.20 | .12 | .22 | .08 | | | | |
| 7 | Network expansion | 3.45 | 0.87 | -.02 | -.02 | .43** | .17 | .13 | -.12 | | | |
| 8 | Network strengthening | 4.33 | 1.05 | .05 | -.09 | .10 | .43** | .23 | .11 | -.09 | | |
| 9 | Change in network density | 0.11 | 0.01 | .15 | .11 | -.25† | .38* | .10 | .06 | -.30* | .20† | |
| 10 | Change in the strength of ties | 0.23 | 0.02 | .10 | .01 | -.34* | .29† | .05 | .24 | -.49** | .32* | -.23* |

Note: † $p < 0.10$; * $p < 0.05$; ** $p < 0.01$

Table 7. Path coefficients from partial least squares with network density as a dependent variable

| Hypothesis | Path from | To | Theoretical model |
|------------------------|--------------------------------|---------------------------|-------------------|
| | Number of founders | Change in network density | .068 |
| | Founders' Experience | Change in network density | .139* |
| H1a | Acquiring knowledge and skills | Change in network density | .174* |
| H1b | Accessing market and resources | Change in network density | -.301** |
| H3a | Network expansion | Change in network density | -.202* |
| H3b | Network strengthening | Change in network density | .065 |
| H4a | Acquiring knowledge and skills | Network expansion | .187* |
| H4b | Accessing market and resources | Network strengthening | .122† |
| R2 (network expansion) | | | 0.30 |

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|----------------------------|------|
| R2 (network strengthening) | 0.28 |
| R2 (network density) | 0.52 |
| GoF | 0.47 |

Note: † $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; t values were calculated through bootstrapping with 200 resamples; GoF: Global Fit Measure (Tenenhaus *et al.*, 2005).

Table 8. Path coefficients from partial least squares with strength of ties as a dependent variable

| Hypothesis | Path from | To | Theoretical model |
|----------------------------|-----------------------|----------------------------|-------------------|
| | Number of founders | Change in network strength | .102 |
| | Founders' Experience | Change in network strength | .090 |
| H2a | Internal obstacles | Change in network strength | -.205* |
| H2b | External obstacles | Change in network strength | .174** |
| H3a | Network expansion | Change in network strength | -0.251* |
| H3b | Network strengthening | Change in network strength | 0.160† |
| H4a | Internal obstacles | Network expansion | 0.108† |
| H4b | External obstacles | Network strengthening | 0.295** |
| R2 (network expansion) | | | 0.44 |
| R2 (network strengthening) | | | 0.35 |
| R2 (strength of ties) | | | 0.67 |
| GoF | | | 0.50 |

Note: † $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; t values were calculated through bootstrapping with 200 resamples and 115 cases per sample; GoF: Global Fit Measure (see Tenenhaus *et al.*, 2005).