Entrepreneurial Agency in Information Technology Creation

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Abstract

Entrepreneurs are typically resource poor when they set out to create their IT innovation. They must seek out and use resources that they do not have to create their innovation. How they do so is at the heart of this study. Successful realisation of such innovations requires collective effort, involving resources and actors both internal and external to the entrepreneur’s own venture. The study is qualitative in nature and uses the grounded theory method to collect and analyse data obtained from interviewing entrepreneurs and collective agents involved in creating IT innovations. The study found that entrepreneurs act to acquire and guide the services of the collective agents to aid them in creating the IT innovation. With specific reference to IT innovation, software development expertise was found to be a critical resource requirement. This process that the entrepreneur undertakes can be explained through a process of entrepreneurial agency that comprises six discrete steps.

1. Introduction

The research problem emanates from a key characteristic of the practitioner community; that is, entrepreneurs are typically resource poor when they set out to create their IT innovation. They must seek out and use resources that they do not have so that their new venture survives and they are able to create their innovation. They do this by leveraging their own social networks and those of other people who they seek out, to obtain resources that are initially outside their reach. Consequently a single entrepreneur acting alone cannot bring a technology-based innovation into being and widespread use [49, 50, 24].

Often the external resource acquiring relationships needed to commercialise innovation are mediated by third parties, known as brokers. How the entrepreneur manages his/her relationship with these network brokers and extracts maximum value from them can be crucial to the outcome of his/her innovation efforts [1, 2].

It is within this context that a broad research question was developed to guide the initial enquiry: What are the drivers, enablers, and inhibitors of resource acquiring relationships between entrepreneurial actors within information technology firms and their network brokers?

IT innovation is distinct from other forms of innovation in that it comprises both computer hardware and software. Research on Information Technology (IT) Innovation is primarily concerned with identifying factors that facilitate or hinder the adoption of new IT-based processes or products [14]. The majority of such research is done within what Fichman [14] calls “the dominant paradigm” which seeks to explain innovation through the use of economic-rationalistic models where organisations with a greater ability to innovate are expected to produce a larger number of innovations. However, researcher reliance on the dominant paradigm within IT innovation research is showing diminishing returns and hampering the progression of new ground-breaking research. Hence, Fichman [14] urges researchers within the field to undertake more innovative approaches to the study of IT innovation itself.

This research study seeks to diverge from the dominant paradigm and takes a more innovative approach to the study of IT innovation. This divergence is to focus on the creation of the IT artefact and consequently focus on the actions of the entrepreneur who undertakes innovation.

Our paper is organised as follows: first literature associated with information technology innovation and entrepreneurship is reviewed; then a summary of the research strategy and methodology used is provided. This includes a discussion of how the grounded theory method was used to collect and analyse the data, and the consequent emergence and development of the social process of Entrepreneurial Agency in IT Creation. Each step of this process is then described using participant stories to illustrate key points. Lastly,
implications for academics and practitioners are discussed.

2. Literature Review

2.1. Information Technology Innovation

Within this section, we begin by reviewing literature associated with technology innovation and, more specifically, IT innovation within the Information Systems (IS) discipline.

An early definition and view of technology innovation is provided by Daft [9] who sees innovation as a process consisting of four essential steps: (a) conception of an idea; (b) proposing of the idea; (c) the decision to adopt the idea; and (d) the implementation of the idea. These ideas originate from institutional members who span the boundary between organisations and technology, and who are expert in a particular task domain and have use for the innovation.

Consequently, Daft [9] defines a technical innovation as an idea for a new product or service which is usually related to technology - as opposed to an administrative innovation. The technical core is responsible for producing the products and services that justify the unit’s existence. The administrative core is responsible for planning, controlling and coordinating the unit’s function both within the team and the wider organisational hierarchy.

Focusing on innovation within a software development group, Zmud [51] concludes, in part, that it may be beneficial to the organisation to manage the diffusion process differently for the software development team and for those managers that are directed at improving the management of the process. Diffusion of innovation refers to the pattern of its adoption by an organisational population over time [46].

Continuing the focus on the diffusion of innovation, Zmud, in a later collaboration, found that while rational decision making models may be useful in explaining information technology adoption, political and learning models may be more useful in examining diffusion, where increased organisational effectiveness is obtained by using the IT innovation [6].

Cooper and Zmud [6] define the term “Information Technology” in a broad sense as referring “to any artefact whose underlying technological base is comprised of computer or communications hardware and software” (p.123). They also provide a definition of technology implementation as viewed through a technology diffusion perspective: “an organizational effort directed towards diffusing appropriate information technology within a user community” (p.124).

2.2. Entrepreneurship – an historical overview

The word entrepreneur is derived from the French word “entreprendre” meaning “to undertake” [26] “ability to take charge” [13]; and when used by Cantillon indicated the general undertaking of a business [32]. Cantillon, the first person to explore the entrepreneurial function in economics [22], was an Irish economist of French descent who introduced the term “entrepreneur” into economic theory to describe a person who is a specialist in taking risks [5].

The notion of risk was refined by US economist Frank Knight [23] who distinguished between risk which is insurable and uncertainty which is not [5]. Knight [23] saw risk as the objective correlative of the subjective uncertainty. Knight emphasised the entrepreneur’s ownership (proprietorship) of the resources of production and responsibility for decision taking and the pursuant risks associated with the decision [10, 20, 21].

Where Knight associated risk with the entrepreneur, Joseph Schumpeter saw risk as the function of the capitalist who lent money to the entrepreneur. Schumpeter saw the entrepreneur as the innovator, the individual who introduces new combinations of production factors [22]. Schumpeter maintained that the function of the entrepreneur is to innovate, or to carry out new combinations [5].

Not only did Schumpeter see the entrepreneur as the innovator, he also saw them as the person who foresaw the entrepreneurial opportunity through their ability to see things differently. For entrepreneurship to occur, Schumpeter [35, 41] maintained that resource owners should not share the same resource conjectures (inference or judgment based on inconclusive or incomplete evidence) and that if all potential entrepreneurs shared the same entrepreneurial conjecture they would compete to capture the same entrepreneurial profit. Or, as Shane and Cable [40] posit, if other entrepreneurs possessed the same beliefs and information, competition between entrepreneurs would eliminate the entrepreneurial opportunity.

2.3. Modern day study of entrepreneurship

Modern day perspectives on entrepreneurship are, in many respects, a synthesis and extension of the views of entrepreneurship developed at the turn of the 20th century. While there are a number of differences, on the whole the similarities of modern day theories with those of the early 20th century are more significant than their differences [4].

There is no definitive theory of entrepreneurship but rather a coexistence of alternative interpretations entwined with historical theory. Consequently to
understand entrepreneurship one must first begin with an appreciation of the core concepts [3].

At its core, entrepreneurship can be construed in terms of arbitrage, innovation, and risk taking, and the entrepreneur as a specialist in taking difficult and complex decisions for which other people do not want to take responsibility [5]. Entrepreneurship is also a self-directed activity that does not occur spontaneously due to the presence of technology or industrial change. It requires the actions of individuals who identify and pursue opportunities which, themselves, lack agency [39].

The entrepreneur is seen as a specialist in finding and leveraging resources [28], and in prying resources away from existing users [34]. They carry out these activities in order to pursue entrepreneurial opportunities and bring their product and/or service innovation into being - in disregard of the resources they control or have at their disposal [46]. The entrepreneur goes about these tasks by balancing variables such as risk taking, innovativeness, and proactiveness [27].

### 2.4. The entrepreneurial agent

Central to the notion of the entrepreneur are their actions to make his/her entrepreneurial idea a reality. Within the social theory based literature the terms “agent” and “actor” are used interchangeably to describe the human actor, while the term “agency” is used to describe human action. Actions are undertaken by human agents who engage in agency, which Giddens sees as not only the intention of people to do things but also their capability to do things in the first place [15].

In addition, agency entails the ability to coordinate one’s actions with others and against others; to persuade, coerce, or monitor one’s own activities or the activities of others [38]. As Sewell, maintains agency is collective as well as individual: “the transpositions of schemas and remobilizations of resources that constitute agency are always acts of communication with others” [38, p. 210].

### 3. Research Strategy and Methodology

This research adopted a qualitative approach as it encompasses, “…research about persons’ lives, stories, behaviour, but also about organizational function, social movements or interactional relationships” [43, p. 17]. Grounded theory was used as the research method as it: (a) allowed us to understand the phenomenon from the perspective of the participants; (b) allowed for researchers with prior experience in the topic area; (c) provided proven tools and processes to manage researcher bias; and (d) as a methodology it was specifically developed as a tool to derive theories of human behaviour that are grounded in empirical data [7, 16, 17, 18, 44, 48].

Grounded theory research is the study of abstract problems and their processes, not units [18]. While we sought to research the actions of human actors involved in the IT creation process, the actors themselves were not the unit of analysis, nor were the organisations with which they interacted. The unit of analysis became the Basic Social Process (BSP) that entrepreneurs go through in order to create the IT artefact and bring its first tangible form into being. A BSP is a “core variable, which recurs frequently in the data, links the various data together and explains much of the variation in the data” [19, p. 124].

A core category may be a BSP but not all core categories are BSPs. A BSP is something that occurs over time and involves change over time with discernible breaking points such that the stages can be perceived as theoretical units with conditions, consequences, and properties unique to each particular stage [17].

### 4. Data Collection and Analysis

In total 24 individual interviews were undertaken. All participants in the study were chosen for their ability to inform the emergent theory. They had all played a role in creating IT-based innovation, either as (a) entrepreneur, (b) intrapreneur (an entrepreneur within an existing organisations), or (c) collective agent.

The interviewees had diverse backgrounds, some had highly developed technical skills, and others had none. They also ranged in age and in the number of entrepreneurial ventures they had participated. Some participants were involved in their first innovation while other participants were serial entrepreneurs having been involved in the creation of a number of innovations both IT and non-IT based. Interviews were conducted over a twelve month period, with each interview analysed and coded soon after the interview.

#### 4.1. Open, Selective Coding and Theoretical Sampling

Once each interview recording had been transcribed, the data were coded. Key words were underlined and assigned a code, according to either an interpretation of what the interviewee had said, or meant, or according to an already developed code which had been “taken from or derived directly from the language of the field: essentially the terms used by the actors in that field themselves” [42, p. 33]. The
As the research progressed, the focus narrowed to investigating issues associated with the emergent theory. Interviewees were selected for their ability to add the slices of data needed to firm up propositions and provide new insights [25]. As Lehmann [25] states “Theoretical sampling therefore concentrates on the categories and areas that are not yet considered to be theoretically saturated” (p.91).

This guidance aptly describes how theoretical sampling was employed within this research project. The analysis of each interview informed the next, leading to the emergence and identification of the core BSP, with the research continuing until theoretical integration and ultimately theoretical saturation, was obtained.

For example the initial interviews began to identify a number of categories and subcategories; specifically issues associated with entrepreneurship, personal aspects, organisational related factors, the innovation, and how the innovation was developed. This led on to the next interviews exploring, in greater detail, issues associated with the entrepreneur and their personal characteristics. Greater understanding in this regard, in turn, led to subsequent exploration to gain an understanding of how the entrepreneur interacted with other people to develop the innovation.

The categories shown in Table 2 are the main categories that emerged from the data in the initial six interviews and these were further explored in subsequent interviews. Other categories were identified and coded against but they reflected items that were not central to the emerging theory and research focus, or they were sufficiently common knowledge within the entrepreneurship and innovation-based fields and consequently did not require further development.

The theoretical sampling associated with the first 18 interviewees had concentrated on understanding personal aspects associated with the entrepreneur, and then how he/she went about interacting with other people to create his/her IT innovation. These categories had become saturated from the entrepreneur’s perspective but not from the perspective of intrapreneurs. These categories were thus revisited through undertaking additional interviews to gather data from intrapreneurs to compare and contrast their perspectives and comments with those of the entrepreneurs.

### 4.2. Reading for theoretical sensitivity

An in-depth exploration and review of literature associated with IT innovation had been precluded from the study up until this stage. This was so that we would be free to see the phenomenon of IT innovation with unbiased eyes and not through the theoretical lens and teachings of established researchers in the field. Such a stance is advised by Glaser [17, 19].

The substantive topic area of IT innovation emerged from the data; it was not forced and it was

<table>
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<th>Table 1. Example of open coding</th>
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<tr>
<td><strong>Interview data – Open coding</strong></td>
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<tr>
<td>Initially it was two people and one developer, and then <strong>built the team up</strong> but, really, without a product we don't have a business, so we have put most of the money and resources into development.</td>
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<td>But yeah, our potential <strong>target market</strong> for our product is pretty much any company in the world that sells to consumers, so it is a big market that could be... honestly we have priced and built it so that the <strong>inner circle of people</strong> could use it right up to... we've had... and we have had (names removed) and other big companies using it.</td>
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<td>So for us, that little team, to <strong>go out to the world</strong> and try and sell it on our own, there is no way that we could cover enough ground, so I think actually <strong>partnership</strong> is going to be our <strong>best strategy</strong>.</td>
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<td>There are <strong>two approaches</strong>: we could go out and try and get a lot of venture capital funding and build up our own sales force, but with the market being the way they are, I just think that would not be the most efficient way to do it, so actually what we are going to do is <strong>partnerships</strong> and working with other companies to reach our target market.</td>
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<th>Table 2. Theoretical sampling</th>
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<td><strong>Interviews 1-12</strong></td>
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<td><strong>Unsaturated Categories</strong></td>
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<tr>
<td>Personal aspects, characteristics of the entrepreneur</td>
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<tr>
<td>- Skill sets</td>
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<td>- Preparing one’s self</td>
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<td>- Vision</td>
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<td>- Frustrations</td>
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<td>- Trapped</td>
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<td>- Business / technical requirements</td>
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free of undue influence from prior research. It was then appropriate to read in the substantive topic area of IT innovation. Within the IT innovation literature, we found a specific line of research called “institutional entrepreneurship”. This research addresses the entrepreneurial actions of institutions and relates them to structuration theory Scott [36, 37]. Seeking to address the neglected question of human agency within institutional entrepreneurship, DiMaggio [12] applied the term “institutional entrepreneur” to explain how new institutions arise through the actions of such individuals.

Within the field of entrepreneurship the phenomenon of intrapreneurship emerged through the work of Pinchot [33] and his development of the term “intrapreneur” to describe someone, who may be the creator or inventor, who takes practical responsibility for turning an idea into a profitable reality within an organisation.

### 4.3. Theoretical coding

This section expands on the theoretical coding process, where theoretical codes conceptualise the categories, their relationship to each other and integrate the theory. Theoretical coding and analysis associated with the wider concept of entrepreneurship incorporating both external “entrepreneurship and internal “intra” entrepreneur ship led to the emergence and development of the BSP of Entrepreneurial Agency in IT Creation.

The labels given to the sub-categories within the BSP of Entrepreneurial Agency emerged over a period of time. They evolved as the constant comparison process progressed, and through writing memos. For example, the label “designing” has its origins in a memo titled “innovation focus” versus “individual focus”.

The following thought sequence, as noted by the first author, is reflected in Table 3.

<table>
<thead>
<tr>
<th>Concept</th>
<th>Seeds</th>
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<tr>
<td>New idea, Intrapreneur, big picture, Champion, Need, capability, Entrepreneur, explore, research, nothing else out there, seek out advice, consideration of business model, external encouragement, restricting information flow, personal motivation, Lateral thinker, ability to protect, data collector, processing facilitator, Invented, think, enabled by prior experience, Competing ideas, uncertain, Spawned, better way, focus, Leveraging – saw opportunity, Conceptualise, picturing success, create, conceive, believing, right time, see ideas clearly – clarity, ambition</td>
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<table>
<thead>
<tr>
<th>Concept</th>
<th>Seeding</th>
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<tr>
<td>To form an idea or concept of something in your mind - to produce something from the mind - to think up something such as a plan or an invention that could be put into action - to understand something</td>
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</table>

<table>
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<tr>
<th>Concept</th>
<th>Designing</th>
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<tr>
<td>Conceiving ultimately gave rise to Designing which better described the actions the entrepreneur undertakes to give initial form to the vision</td>
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The category of designing had originally been labelled “seed”, where a new idea takes seed within the entrepreneurs mind. They are able to see the bigger picture of what the opportunity and innovation looks like as well as commercial aspects including possible exit options. However, this did not explain the actions of the entrepreneur. Consequently the category was re-examined and the label “Conceiving” was given to it. Over time that label changed to Designing, which better explained the actions entrepreneurs undertake to give initial form to their vision. The identification of the other labels within the BSP of Entrepreneurial Agency followed a similar evolution.

### 5. Entrepreneurial Agency in IT Creation

Entrepreneurial Agency in IT Creation is a social process-based theory. The theory looks at the actions the entrepreneur undertakes to create IT innovation and how they unfold over time in six definable stages: Designing; Establishing; Acquiring; Guiding; Validating and Extricating. The theory has two primary constructs Entrepreneurial Agency and Collective Agency, which, when combined within a social structure called the entrepreneurial “ba” creates IT Innovation.

The term ba is derived from the work of Nonaka and colleagues [29, 30, 31] and represents the physical, virtual, or mental space where knowledge is acquired and combined. The word ba is Japanese and translates roughly to the English word “space”. It refers to a shared space for emerging relationships. It does not necessarily mean a physical space, but can mean a
virtual space such as email or a mental space such as shared ideals. Participants of *ba* cannot be mere onlookers but must be committed to *ba* through action and interaction. Knowledge is acquired through individual experience or reflections on others’ experience, within any of these shared spaces. To participate in *ba* means to become engaged in knowledge creation through transcending one’s own limited perspective or boundaries. When knowledge is separated from a *ba* it becomes information so that it can be communicated beyond the *ba* [31].

Where Nonaka and colleagues use the term “shared space”, sociologists Giddens [15] and Sewell [38] use the term “social structures” to describe the space where human actors interact within and relate to each other.

Whether it is a new institution or a new project team that is established, both the entrepreneur and intrapreneur act to establish a shared space where they can interact with collective agents and guide their activities. Within this research the term entrepreneurial *ba* is used to describe that shared space.

These interactions between the entrepreneur and collective agents within the Entrepreneurial Agency (EA) process are shown in Figure 1. When related to the initial stages of the EA process – designing, establishing, and acquiring – the model represents: (a) the actions that the entrepreneur gives to articulating the innovation design and business model, (b) the collective agents required, (c) the agency that the entrepreneur envisages is needed to create the IT innovation; and (d) the shared context, the entrepreneurial *ba*, which the entrepreneur needs to establish in order to facilitate interactions during the EA process. The entrepreneurial *ba* accounts for both the start-up institution established by the external entrepreneur, and the new project team established by the internal intrapreneur. This process that the entrepreneur undertakes when creating an IT innovation is illustrated as follows:

![Diagram](image.png)

Figure 1. A model of Agency in IT Creation

5.1. Designing

Within the designing stage of the EA process, the entrepreneur architects the road map for the innovation and associated business model and produces a conceptual design of the innovation which he/she uses to create the innovation. The flow of information and knowledge within this stage is mainly towards the entrepreneur, for them to make sense of and act upon. The entrepreneur not only utilises his/her prior knowledge and experiences, but also draws upon personal and professional relationships to access knowledge they do not possess.

When developing the high level design for their IT innovation, the entrepreneur becomes the architect of a road map that acts as a blueprint for the journey they seek to embark on. The entrepreneur does not need to have deep IT-based technical knowledge, as evidenced by interviewee (I-5) who openly credits herself and her business partner with the origination of the idea and the underlying business solution “we definitely invented the idea; we came up with the idea...a solution for businesses” (I-5). But as interviewee (I-5) further comments, she did not personally need to have a detailed knowledge of IT: “I really had no idea that I could be involved in making software, I thought that was for people who were trained in that... I cannot code, but I can map out flowcharts and I can map out needs. This is what the company needs, and this would be the ideal solution” (I-5).

The entrepreneur not only needs to conceptualise his/her understanding of the innovation but also to develop a view as to how they are going to go about creating the IT artefact. For interviewee (I-10) he thought the best way forward was to build his business model around open source technologies.

The open source community provided access to software tools and applications as well as marketing networks that this entrepreneur (I-10) could not afford to replicate. A similar collaborative based business model was adopted by interviewee (I-5) in that she did not seek to develop her own sales and marketing channels, but she sought to build partnerships and leverage the resources of existing networks.

When describing how her innovation originated, interviewee (I-5) makes reference to how she drew upon and leveraged experience gained from custom software development for a previous business she and her partner had established “So the initial foray into technology came with the ... company, we really needed some sort of technology to manage our payments and our collecting customer information and managing customer bookings, so we actually looked around for different vendors and could not find anything that would work, so we custom made our own
software just for our company... Prior to that, I really had no idea that I could be involved in making software, I thought that was for people that were trained in that” (I-5).

This prior knowledge, then, gave interviewee (I-5) the skills and confidence to progress the creation of her new IT web-based innovation. As she concedes “we learned a lot through that...well it didn’t necessarily go well, we made lots of mistakes, but I learned that it was something that I could be involved in” (I-5).

5.2. Establishing

To facilitate the later stages of the EA process, the entrepreneur establishes a shared context, the entrepreneurial ba. This creates a place and vehicle through which the entrepreneur can acquire resources and guide the actions of collective agents to create the IT innovation. The entrepreneurs associated with this research did this either by establishing new start-up institutions or new internal project teams.

Interviewees (I-15), (I-8) and (I-17) all wanted to establish their own businesses but needed a product to fulfil that ambition.” I wanted to work with all my friends. The next thing that I thought was ‘I wonder if it’s possible to build a technology company where you could have a lot of fun, a company that keeps its promises and makes money’, and that was kind of the idea that was rattling round in my head, and that’s really where...came from” (I-15).

When the entrepreneur is operating within an existing company and seeks to use internal resources to progress the creation of the innovation, a new internal temporary substructure is required. Interviewees in the later stages of the research referred to this structure as a project team. These teams are typically project based and temporary in nature. When a project or new opportunity arises team members are selected to work on the project based on their ability to contribute to that particular project. As interviewee (I-20), a collective agent, states “Teams are built, plateau, and then slide away” (I-20).

How the entrepreneur uses the outputs of the designing stage and the establishment of the entrepreneurial ba to acquire the services of collective agents is the third stage of the EA process.

5.3. Acquiring

In order to create the IT innovation at the centre of their entrepreneurial vision, the entrepreneur must acquire the necessary services of the collective agents. Software development expertise, whether the entrepreneurs own expertise or they acquire it from others, was acknowledged as an essential element by all the entrepreneurs within the study.

The extent to which the entrepreneurs sought to acquire software development expertise varied widely, ranging from recruiting and/or using internal institutional resources, colleagues, and business partners to acquiring outsourced software development services from local software development teams or even from development teams located throughout the world.

Interviewee (I-5) sought to include software development companies as an integral part of her virtual team “So we opted for very small company, two or three man shows where exactly the person that we were talking to is the person who was going to develop our product. By now they have basically become part of our team”.

Even in instances where entrepreneurs had some level of expertise in software development, they still needed to acquire and utilise additional expertise, due to advances in programming languages and the need to focus on wider aspects associated with the EA process. This was the case for interviewee (I-6) “I used to be the programmer...but then we brought in a programmer to...release me to do more of the business side of things” (I-6).

Interviewee (I-6) also needed to acquire someone who had more expertise in new software development languages “one of the challenges with programming is that languages have changed over the last few years...because of the new languages it is way more technical and we need more expertise to do it” (I-6).

Once the entrepreneur has acquired the services of the collective agents, they must then guide their actions to create the IT innovation in accordance with their initial design concept.

5.4. Guiding

Within the guiding stage the IT innovation starts to materialise through the combined agency of the entrepreneur and collective agents. The entrepreneur guides the actions of collective agents, so that the outcomes are consistent with his/her early vision of the IT innovation. As they go about their tasks, the entrepreneur and collective agents need to work together so that they can solve the numerous problems and issues that they encounter along the journey. This additive impact sees the tacit knowledge of both the entrepreneur and collective agents combined together and embedded into the innovation. With specific reference to the IT artefact, the entrepreneur works with software developers to capture and embed their entrepreneurial vision within software code.
Until this point, the innovation has been nothing more than an idea that has been expressed by way of a design produced in the designing stages of the EA process “generally it starts with a concept paper which will have some text and some images that you’ve crafted yourself. This is what I have done anyway...And then...it’s going to be PowerPoint, it’s going to be...software mock-ups or website development screen shots...and it’s that process of showing people the picture” (I-12).

As interviewee (I-12) states, once a basic design has been developed, it is then a matter of showing people (collective agents) the picture, so that they can undertake the actions needed to create the IT innovation, and deliver on the entrepreneur’s vision.

Similarly interviewee (I-18), a self-confessed non-IT person, attributes her ability to innovate with IT to her ability … to bring a diverse group of people together to explore an issue and then arrive at the correct solution. She calls this the “additive impact”. “I’m not a technical person and it takes a long time for me to learn and understand a lot of the technicality...A talent that I have, that’s somehow developed, is to be able to bring a diverse group of people together and to not know the right answer but to be able together to find the right way forward...So I’m a great believer in that additive impact really...But it depends on all parties being prepared to look for the best solution” (I-18).

It is in this fifth step of the EA process, validating, where the first tangible manifestation of the IT innovation is created, tested, and actual feedback obtained based on first use of the innovation.

5.5. Validating

At the validating stage of the EA process the entrepreneur is able to validate and prove his/her original design concept through the demonstration and testing of a working prototype. Based on the feedback of early internal and external users, the entrepreneur is able to make changes to improve the design where needed.

The beta product allows the entrepreneur and collective agents to trial the rudimentary version and to obtain feedback from early users to incorporate into a refined design and incremental build process. “You put something out there... get the feedback and build on top of that” (I-6).

In addition to obtaining feedback, at this point the entrepreneur may also wish to be identified as being the first in a market, thus obtaining first mover advantages and visibly showing that they have something new and innovative. “The pilot was to first and foremost to prove that we had a working system that people could come and visit and see” (I-9).

As the entrepreneur moves through the EA process, his/her agency is increasingly diluted and combined with the agency of the collective agents they have acquired to aid them in their tasks. The dilution eventually reaches a point where the entrepreneur’s involvement is overtaken by that of the collective agents.

5.6. Extricating

By the time this final stage of the EA process is reached, the entrepreneur has taken their entrepreneurial idea from a point where it was an intangible thought and, through his/her own agency and that of the collective agents, has turned it into a tangible reality.

The entrepreneur increasingly removes him-/herself from the innovation-specific tasks in order to be able to focus on the next innovation, the next entrepreneurial opportunity, or to move back to an existing role or undertake additional duties as a collective agent within the wider institution.

The entrepreneurs within the study knew from the beginning that they could not do it alone and would need to acquire the services of collective agents to aid them on their journey. For example, interviewee (I-17) commented, that it was part of the challenge and personal reward he got from his entrepreneurial agency “on one level it’s the concept that people will give me money for something that I invented. That’s pretty cool. And another one is that people want to come along with the adventure. And I think the biggest one is the adventure itself (I-17).

Interviewee (I-17) had continually sold off shares in his business - which equated to ownership control - to fund the EA process to a point where two directors of the business had become concerned for him and his opportunity to realise the appropriate level of rewards for his agency “we’ve got two new directors that have come on recently and they’re both independently said “I’m actually really concerned for...because he’s diluted himself and he hasn’t got...the largest chunk of the company” (I-17).

For interviewee (I-17) that had been his plan from the beginning “...and my reply to that was, “Well, actually, you know, that was the whole idea” (I-17).

It is at this demarcation point, extricating, that the EA process in IT creation ends. The IT innovation is created and the collective agency has overtaken the entrepreneur’s entrepreneurial agency. Subsequent actions of the entrepreneur or collective agents in the adoption, use, and diffusion of the innovation are outside the scope of this research study.
6. Conclusions and Future Work

The research question guiding the initial enquiry sought to identify the drivers, enablers, and inhibitors of the resource acquiring relationship. As the research progressed it became evident that entrepreneurial actors need to acquire and guide the services of the collective agents to aid them in creating the IT innovation. The driver is the need to create the IT innovation and the need to acquire the necessary skills and expertise required. We also found that the relationship is not between two equal parties with similar positions. The relationship is based on differences as the entrepreneur is the originator and holder of entrepreneurial vision and the guide who shows the way to the collective agents. To obtain maximum benefit from the relationship, the entrepreneur has to dilute his/her agency over time, allowing the agency of the collective agents to overtake his/her entrepreneurial agency.

For academics within the IS domain, this study provides an abstracted agency-based view of the innovation process from the point where the external and internal entrepreneur architects the first rudimentary road map of the innovation until the point where the innovation is made tangible in a prototype and the agency of the entrepreneur is overtaken by that of the collective agents. This is done through displaying and explaining the key categories and their associated properties, while at the same time maintaining conceptual parsimony.

For practitioners within the IT innovation field the social process of Entrepreneurial Agency in IT Creation provides a set of recommendations for practice:

1. The entrepreneur will undertake actions to give initial form to the vision.
2. The entrepreneur will undertake actions to establish the entrepreneurial ba.
3. The entrepreneur will undertake actions associated with articulating and sharing the vision, to attract and acquire the required resources.
4. The entrepreneur will undertake actions that show the way to collective agents and guide their actions so that they can combine the resources into new combinations to make the innovation tangible.
5. The entrepreneur will undertake actions to demonstrate, validate and improve the innovation in an agile and adaptive manner.
6. The entrepreneur will undertake actions at some point that seek to remove him-/herself from direct, hands-on involvement with the innovation and its associated process.

This research suggests that IT innovation is largely a dimension of the intellectual property of the entrepreneur and collective agents such as software developers. The IT artefact is seen as a product of intangible resources that is made tangible through software code resident within hardware and information and communication Networks. Future research is required to further understand and measure what resource inputs and combinations are needed to create an IT innovation.

In addition, the model of agency in IT Creation has the potential to provide a testable framework that explains how entrepreneurial actors and collective agents act within structures to create IT innovation.

7. References