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I&E Minor Thesis

Comparison of Spinoffs vs StartsUps in innovation capabilities

Study of factors affecting innovation methods of spinoffs and startups

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Abstract

In recent years, our lives have been drastically improved by revolutionary technologies and innovations. This has been made possible by visions of entrepreneurs and leaders working in businesses like spin-offs and start-ups. Both spin-offs and start-ups have been widely adopted in entrepreneurial world and have been proven to be highly successful in terms of competitiveness, innovativeness, growth, and economical development. However, there is still a gap in understanding the major differences in innovation capabilities of spin-offs and start-ups. This research is focused on finding the major factors which affect the innovation performance of start-ups and spin-offs. Literary theories i.e. resource-based theory, human capital theory, social capital theory and motivational theory had been used to find such factors and developed hypotheses which were tested using literature reviews and qualitative exploratory questionnaires. This study will help weave the path for future theoretical and experimental research on comparing start-ups with spin-offs regarding innovation developments and help business owners to plan their innovative strategies efficiently.

Keywords: Startup, Spin-offs, Innovation Capabilities, Innovation Performance, Resource-based Theory, Human Capital Theory, Social Capital Theory, Motivational Theory

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1 Introduction

In this world of technological and innovation development, we have seen a continuous evolution in types of businesses. Though the objective of each type of firm is same i.e. to generate revenue by creating value for customers, there are differences in their approach to innovate and maintain sustainability. Two types of businesses which have been the focus of attention to entrepreneurs and researchers for many years are spin-offs and start-ups. Both businesses have contributed to improve nations economies and employment rates. However, there are differences in their innovation capabilities and their establishment processes.

1.1 Motivation

In entrepreneurial literature, there have been several studies for understanding the taxonomy and formation of spin-off firms and start-ups. Researchers have been trying to narrow the gap between theoretical understanding of processes adopted by spin-offs and start-ups and their related practical implications. Both businesses have been studied to understand their topologies, reasons of success and failures [1], and their affects on the economical growth[2]. There are also numerous comparative studies between spin-offs and start-ups based on technological development [3], resource inheritance and exploitation [4], and survival and growth rate [5]. However, there has been little research on finding the major factors which affect the innovation processes of start-ups and spin-offs.

1.2 Objective

The purpose of this paper is to investigate major factors which affect the innovation methods of spin-offs and start-ups. It has addressed this problem by reviewing existing literature and using exploratory interviews with founders of spin-offs and start- ups. This study will guide the future research in this domain and facilitates business owners to develop strategies for their businesss success.

1.3 Outline

The remainder of this paper is summarized as follows:
In **Section 2**, prior research will be discussed in order to lay foundations of the problem in hand.

Based on the theoretical discussion,**Section 3** will describe theoretical framework which will help to identify major factors for comparison and derive hypotheses.

In **Section 4**, methodology of collecting data for testing hypotheses will be discussed

Section 5 will analyze the data and derive meaningful results.

Final **Section 6** concludes the research , discusses its potential benefits and identifies the opportunities for future work.

2 Literature Review

This section explains the important definitions and previous research on start-ups and spin-offs to gain better understanding of purpose of this research.

2.1 Definitions of Start-Ups

According to **Wikipedia** [6]: "A startup company (startup or start-up) is an entrepreneurial venture which is typically a newly emerged, fast-growing business that aims to meet a marketplace need by developing or offering an innovative product, process or service."

According to Steve Blank [7]: "A startup is a temporary organization designed to search for a repeatable and scalable business model".

"A startup is a company working to solve a problem where the solution is not obvious and success is not guaranteed," says Neil Blumenthal, co-founder and co-CEO of Warby Parker [8].

TechCrunch writer Alex Wilhelm defines startup by "50-100-500" rule as follows: "If your company has, or is any of the following, you have to hang up your Startup Uniform, and realize that you are just another technology company either hunting for or actively avoiding an IPO," Wilhelm writes. "$50 million revenue run rate (forward 12 months); 100 or more employees;Worth more than $500 million, on paper or otherwise." [9]

In a nutshell, there exists no single definition of start-up. Having read many definitions and views of people about start-ups, I have come up with my own definition:

"A start-up is an entrepreneurial venture aimed at creating value for itself and its customers by solving a specific problem and embracing risks and failures on its way to become a stable business. It is the outcome of efforts of individuals who work on their own resources without inheriting any support from other organizations."

2.2 Definitions of Spin-Offs

According to **Wikipedia**[10]:
"Spin-offs are divisions of companies or organizations that then become independent businesses with assets, employees, intellectual property, technology, or existing products that are taken from the parent company."

According to **Merriam Webster Dictionary** [11]:
"spin-off is the distribution by a business to its stockholders of particular assets and especially of stock of another company; also: the new company created by such a distribution"

The Economist Group Limited published in blog "**The art of the spin-off**" [12]:
"In business, spin-offs are the offspring of established companies. You take a division and turn it into a free-standing firm."

A number of other studies define a spin-off as a firm whose intellectual capital originates in its parent, for example, a university, research institute, or another companies [13]. The definition of spin-off varies depending upon the type of spin-off we are referring to. Broadly speaking, there are two types of spin-offs i.e. Academic spin-offs and Corporate spin-offs. These two types are further classified by researchers based on resource transfer, parental support and reasons of their creation [14]

2.3 Previous Research on Start-Ups

Research on Start-ups have been going on since 1980s. The relationship between innovativeness and success of firms has been the focus of research in literature for many decades. Schumpeter [15] described that innovativeness increased market power of a firm. Porter [16] explained that innovation improved the ability of firms to break competition. Zahra and George [17] had credited innovativeness for enhancing absorptive capacity of a company.

However, a lot of researchers also described negative affects of innovativeness. Samuelsson and Davidsson [18] stated that innovations could lead to introducing risks in success of start-ups. Amason, Shrader and Tompson [19] had declared innovativeness and novelty a great liability in the path of start-ups success . John Freeman and Jerome S. Engel [20] had compared start-ups with corporate companies in their innovation models. According to them, big companies have more capital, scientists and engineers, brand presence, strategic alliances, evolving organizational structures, and well established business processes. On the other hand, young firms are a victim of newness and are at higher risks of failure in the beginning. However, they have also mentioned that big companies can fail in developing innovative products due to immobility in resources and misalignment of incentives. In such scenarios, start-ups could evolve into sustainable,

growing and profitable businesses. Ari Hyytinen , Mika Pajarinen and Petri Rouvinen [21] suggested that a startup's innovativeness might in fact hurt its survival prospects. Their research has found that survival rate for innovative startups is approximately 67 percentage points lower than that of non- innovators. They also find that the interaction of innovativeness and entrepreneurs' greater appetite for risk further reduces the prospects for survival.

In view of extensive research on finding affects of innovativeness on start-ups, it seems that innovation might have either a positive or negative affect on start-ups success rate. However, empirical literatures mostly states that results are positive [21].

2.4 Previous Research on Spin-Offs

No one can deny the importance of spin-offs in recent economic developments. Forbes calculates that American companies completed more than 80 spin-offs worth at least $500m each between 2002 and 2012 [12].There has been research on understanding corporate spin-offs topology [22]. Helmut and Mike [23] studied topology of spin-offs with respect to their environmental contexts as shown in figure 2.1 and defined four types of spin-offs i.e. Academic spin-off, Corporate spin-off, Privatization buyout/buy-in of university research and Management buy-out/buy-in of division.

		Environmental context	
		University context	Commercial context
Firm level – spin-off mode	New firm	QUADRANT 1 Alumni start-up Academic spin-off (pure) Academic spin-off (hybrid)	QUADRANT 2 Corporate spin-off (use of intellectual property/assets) Employee spin-off (no direct use of intellectual property/assets)
	Existing activity	QUADRANT 3 Privatization buyout/buy-in of university research agency/station	QUADRANT 4 Management buyout of division Management buyin of division

Figure 2.1: topology of spin-offs. Adapted from "The origin of spin-offs: a typology of corporate and academic spin-offs." by Fryges, Helmut, and Mike Wright. Small Business Economics 43.2 (2014)

2.5 Previous Research on Comparison of Spin-Offs with Start-Ups

2.6 Standardization

This sections outlines standardization approaches regarding X.

Name	Vendor	Release Year	Platform
A	Microsoft	2000	Windows
B	Yahoo!	2003	Windows, Mac OS
C	Apple	2005	Mac OS
D	Google	2005	Windows, Linux, Mac OS

Table 2.1: Comparison of technologies

2.6.1 Internet Engineering Task Force

The IETF defines SIP as '...' [24]

2.6.2 International Telecommunication Union

Lorem Ipsum...

2.6.3 3GPP

Lorem Ipsum...

2.6.4 Open Mobile Alliance

Lorem Ipsum...

2.7 Concurrent Approaches

There are lots of people who tried to implement Component X. The most relevant are ...

3 Requirements

This section determines the requirements necessary for X. This includes the functional aspects, namely Y and Z, and the non functional aspects such as A and B.

3.1 Overview

In this chapter you will describe the requirements for your component. Try to group the requirements into subsections such as 'technical requirements', 'functional requirements', 'social requirements' or something like this. If your component consist of different partial components you can also group the requirements for the corresponding parts.

Explain the source of the requirements.

Example: The requirements for an X have been widely investigated by Organization Y.

In his paper about Z, Mister X outlines the following requirements for a Component X.

3.2 Technical Requirements

The following subsection outlines the technical requirements to Component X.

3.2.1 Sub-component A

Interoperability
Lorem Ipsum...

Scalability
Lorem Ipsum...

3.2.2 Sub-component B

Lorem Ipsum...

3.3 Social Requirements

Component X must compete with Y. Hence, it is required to provide an excellent usability. This includes ...

4 Concept

This chapter introduces the architectural design of Component X. The component consists of subcomponent A, B and C.

In the end of this chapter you should write a specification for your solution, including interfaces, protocols and parameters.

4.1 Sub-component A

The concept chapter provides a high-level explanation of your solution. Try to explain the overall structure with a picture. You can also use UML sequence diagrams for explanation.

Figure 4.1 illustrates the situation between Alice and Bob. (sequence diagram from www.websequencediagrams.com)

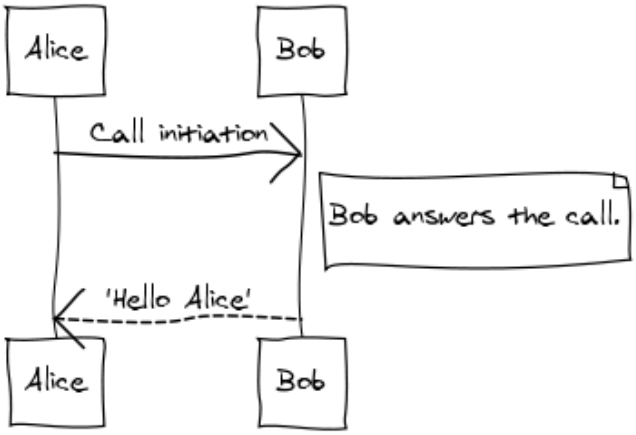

Figure 4.1: Alice and Bob

4.2 Sub-component B

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4.3 Proposed API

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4.4 Layer X

Lorem Ipsum...

4.5 Interworking of X and Y

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4.6 Interface Specification

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5 Implementation

This chapter describes the implementation of component X. Three systems were chosen as reference implementations: a desktop version for Windows and Linux PCs, a Windows Mobile version for Pocket PCs and a mobile version based on Android.

5.1 Environment

The following software, respectively operating systems, were used for the implementation:

- Windows XP and Ubuntu 6
- Java Development Kit (JDK) 6 Update 10
- Eclipse Ganymede 3.4
- Standard Widget Toolkit 3.4

5.2 Project Structure

The implementation is seperated into 2 distinguished eclipse projects as depicted in figure 5.1.

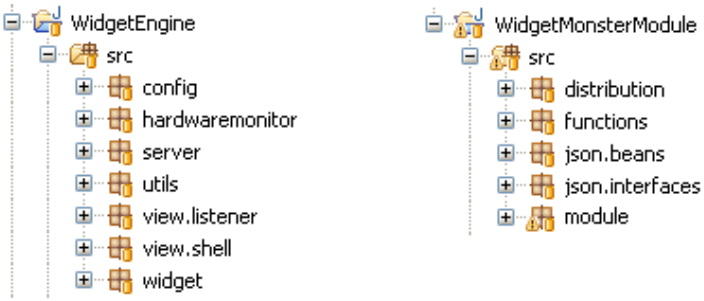

Figure 5.1: Project Structure

The following listing briefly describes the single packages of both projects in alphabetical order to give an overview of the implementation:

config
Lorem Ipsum...

server
Lorem Ipsum...

utils
Lorem Ipsum...

5.3 Important Implementation Aspects

Do not explain every class in detail. Give a short introduction about the modules or the eclipse projects. If you want to explain relevant code snippets use the 'lstlisting' tag of LaTeX. Put only short snippets into your thesis. Long listing should be part of the annex.

Listing 5.1: JSON String Code Snippet

```
{
        id: 1,
        method: "myInstance.getGroup",
        params: ["Teammates", 2, true]
}

{
        id: 2,
        result: [
                  "groupDesc":"These are my teammates",
                  {
                        "javaClass":"src.package.MemberClass",
                        "memberName": "Bob",
                  }
                ]
}
```

You can also compare different approaches. Example: Since the implementation based on X failed I choosed to implement the same aspect based on Y. The new approach resulted in a much faster ...

5.4 Graphical User Interface

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5.5 Documentation

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6 Evaluation

In this chapter the implementation of Component X is evaluated. An example instance was created for every service. The following chapter validates the component implemented in the previous chapter against the requirements.

Put some screenshots in this section! Map the requirements with your proposed solution. Compare it with related work. Why is your solution better than a concurrent approach from another organization?

6.1 Test Environment

Fraunhofer Institute FOKUS' Open IMS Playground was used as a test environment for the telecommunication services. The IMS Playground ...

6.2 Scalability

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6.3 Usability

Lorem Ipsum

6.4 Performance Measurements

Lorem Ipsum

List of Acronyms

3GPP	3rd Generation Partnership Project
AJAX	Asynchronous JavaScript and XML
API	Application Programming Interface
AS	Application Server
CSCF	Call Session Control Function
CSS	Cascading Stylesheets
DHTML	Dynamic HTML
DOM	Document Object Model
FOKUS	Fraunhofer Institut fuer offene Kommunikationssysteme
GUI	Graphical User Interface
GPS	Global Positioning System
GSM	Global System for Mobile Communication
HTML	Hypertext Markup Language
HSS	Home Subscriber Server
HTTP	Hypertext Transfer Protocol
I-CSCF	Interrogating-Call Session Control Function
IETF	Internet Engineering Task Force
IM	Instant Messaging
IMS	IP Multimedia Subsystem
IP	Internet Protocol
J2ME	Java Micro Edition
JDK	Java Developer Kit
JRE	Java Runtime Environment
JSON	JavaScript Object Notation
JSR	Java Specification Request
JVM	Java Virtual Machine
NGN	Next Generation Network
OMA	Open Mobile Alliance
P-CSCF	Proxy-Call Session Control Function
PDA	Personal Digital Assistant
PEEM	Policy Evaluation, Enforcement and Management
QoS	Quality of Service
S-CSCF	Serving-Call Session Control Function
SDK	Software Developer Kit
SDP	Session Description Protocol
SIP	Session Initiation Protocol
SMS	Short Message Service

SMSC	Short Message Service Center
SOAP	Simple Object Access Protocol
SWF	Shockwave Flash
SWT	Standard Widget Toolkit
TCP	Transmission Control Protocol
Telco API	Telecommunication API
TLS	Transport Layer Security
UMTS	Universal Mobile Telecommunication System
URI	Uniform Resource Identifier
VoIP	Voice over Internet Protocol
W3C	World Wide Web Consortium
WSDL	Web Service Description Language
XCAP	XML Configuration Access Protocol
XDMS	XML Document Management Server
XML	Extensible Markup Language

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Annex

```
<?xml version="1.0" encoding="UTF-8"?>
<widget>
         <debug>off</debug>
         <window name="myWindow" title="Hello Widget" visible="true">
                 <height>120</height>
                 <width>320</width>
                 <image src="Resources/orangebg.png">
                        <name>orangebg</name>
                        <hOffset>0</hOffset>
                        <vOffset>0</vOffset>
                </image>
                 <text>
                         <name>myText</name>
                         <data>Hello Widget</data>
                         <color>#000000</color>
                         <size>20</size>
                         <vOffset>50</vOffset>
                         <hOffset>120</hOffset>
                 </text>
        </window>
</widget>
```

Listing 1: Sourcecode Listing

```
INVITE sip:bob@network.org SIP/2.0
Via: SIP/2.0/UDP 100.101.102.103:5060;branch=z9hG4bKmp17a
Max-Forwards: 70
To: Bob <sip:bob@network.org>
From: Alice <sip:alice@ims-network.org>;tag=42
Call-ID: 10@100.101.102.103
CSeq: 1 INVITE
Subject: How are you?
Contact: <sip:xyz@network.org>
Content-Type: application/sdp
Content-Length: 159
v=0
o=alice 2890844526 2890844526 IN IP4 100.101.102.103
s=Phone Call
t=0 0
c=IN IP4 100.101.102.103
m=audio 49170 RTP/AVP 0
a=rtpmap:0 PCMU/8000

SIP/2.0 200 OK
Via: SIP/2.0/UDP proxy.network.org:5060;branch=z9hG4bK83842.1
;received=100.101.102.105
Via: SIP/2.0/UDP 100.101.102.103:5060;branch=z9hG4bKmp17a
To: Bob <sip:bob@network.org>;tag=314159
From: Alice <sip:alice@network.org>;tag=42
Call-ID: 10@100.101.102.103
CSeq: 1 INVITE
Contact: <sip:foo@network.org>
Content-Type: application/sdp
Content-Length: 159
v=0
o=bob 2890844526 2890844526 IN IP4 200.201.202.203
s=Phone Call
c=IN IP4 200.201.202.203
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```

Listing 2: SIP request and response packet[25]