BUSINESS MODEL DEFINITION METHODOLOGIES FOR TELCOMMUNICATION SERVICES

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Abstract

Business Models related topics have caught much attention both in business practice and in scientific research. In spite of this great interest there seems to be not so much shared understanding of the business model concept. Research on Business Models interests several disciplines which study this phenomenon with different objectives and points of view. As a side effect, research contributions in this area of interest overlap or conflict each others and, at the same time, there is a wide abundance of definitions of the Business Model concept. Transferred to practice this confusion in research may produce misleading conceptualization of Business Models which can introduce difficulties when different subjects are involved in the exploitation of a new technology. By reviewing relevant literature in this area of interest this paper will identify available conceptual tools and methodologies for business modelling that could be applied to the telecommunication sector. The literature review will help in selecting most relevant contributions in this area of interest among papers published in peer reviewed journals.

1. - Introduction

Business Models (BMs) related topics have caught much attention both in business practice and in scientific research (Alt and Zimmermann 2001). In spite of this great interest there seems to be not so much shared understanding of the business model concept as common theoretical backgrounds, and even a shared definition of the term are missing (Gordijn et al. 2005). This term started to be popular at the onset of the new economy (Feng et al. 2001) when start-ups were facing fast changing scenarios and subsequent difficulties in forecasts formulation. Confronted with these
obstacles, in spite of compiling a traditional business plan, start-ups used the “Business Model” (BM) as a way to synthetically describe how they will have generated profits.

Research on BM interests several disciplines which study this phenomenon with different objectives and points of view (Tikkanen et al. 2005). As a side effect, research contributions in this area of interest overlap or conflict each others. As a result there is a wide abundance of definitions of the BM concept (Shafer et al. 2005). Definitions in literature vary in context and structure. As a matter of example, the following definitions indicate how blurred the BM concept is:

- “the organization’s core logic for creating value” (Linder and Cantrell, 2000);
- “a story that explains how an enterprise works” (Magretta, 2002)
- “the way we make money” (Bienstock et al., 2002)
- “an architecture for the product, service and information flows, including the various business actors and their roles; a description of the potential benefits for the various business actors and a description of the sources of revenues” (Timmers, 1998)
- “a clearly stated plan for adding economic value by applying know-how to a set of resources in order to create a marketable product or service” (Miles et al., 2000)
- “a unique blend of three streams that are critical to the business. These include the value stream for the business partners and the buyers, the revenue stream, and the logistical stream” (Mahadevan, 2000).

Compatibility and interoperability among proposed solutions is not always taken into account (Pateli and Giaglis 2004). Moreover, a large part of authors writing on BMs simply ignore the need to look at the object of study from a cross disciplinary point of view (Braccini and Spagnolletti 2008). Transferred to practice this confusion in research may produce wrong methodologies and misleading conceptualization of BMs which can introduce difficulties when different subjects are involved in the exploitation of a new technology.

Interest in BMs is high where research is interested in the value obtainable from a new technology. The telecommunication sector is interested by a continuous improvement process which delivers new products and services to the market. Innovative solutions are just round the corner and are continuously introduced by players in the market. Identifying and describing, or better defining, sustainable BMs in the telecommunication sector, as well as in other areas, is an ever actual need.

In order to find solutions to these problems, some of the authors that are more aware of the fragmentation and the interoperability issues in this area of research aim to systematize and organize past research experiences, defining frameworks, categories, taxonomies and ontologies of BMs (Bienstock et al. 2002, Gordijn and Tan 2005, Osterwalder et al. 2005, Shafer et al. 2005).
By reviewing relevant literature in this area of interest this paper will identify available conceptual tools for business modelling that could be applied to the telecommunication sector. The literature review will help in selecting most relevant contributions in this area of interest among papers published in peer reviewed journals.

The structure of the paper is as follows. § 2 describes the methodology adopted in this paper; § 3 contains the results of the literature review, which are subsequently analysed in § 3.1 and § 3.2; § 4 introduces the two conceptual tools available in literature to define a BM which are illustrated in § 4.1 and § 4.2 and compared in § 4.3; finally § 5 draws some conclusions.

2. - Research Methodology

To identify key directions and leading methodologies for BM definition, a literature review on the topic has to be carried out. To review relevant literature on BMs it is necessary to pay attention to two elements. First of all, given the multidisciplinary characteristic of this area of interest, the literature review does not have to focus only on a specific field of study, but need to cross discipline borders to enter other fields where the concept may have been studied and developed, as suggested in (Webster and Watson 2002). Afterwards, considering how blurred the BM concept is, though selection criteria have to be adopted to select papers to be analysed.

For the first aspect, in order to collect relevant literature the Business Source Premier database of scholarly peer reviewed journals has been used as a source for paper selection. This database includes more than 8000 journals covering several topics like management, finance, accounting, administration and economics, granting a wide discipline coverage for the literature of interest in this paper.

As for the selection criteria, papers to be analysed were identified using the term “Business Model” (including the plural form as well as other variants of the term like eBusiness Model) as a search key, restricting the time interval to paper published from January 1st 1990. The search key has been used to get most relevant contributions by searching in the title and in the keywords, on the base of the assumption that papers citing the term in these fields are those more close to the topic. This research produced two overlapping sets of papers (210 containing the term in the title and 108 containing it in the keywords): these were joined to form, avoiding overlaps, a final sample of 261 papers. The sample size was reduced discarding all the contributions that do not clearly contribute to clarify the BM concept, on the base of the results of a text analysis. The final sample is composed by 57 papers. Such a reduced number (compared to the original sample size) has to be justified on
the base of the consideration that the BM term is often used in management related topics, but not always in contexts that are of interest for this paper.

The discipline of pertinence of the selected papers has been identified on the base of the subject area of the journal where the paper was published, as indicated in the Journal Quality List (Harzing 2007).

Finally, the selected literature has been analysed using qualitative positioning maps and the Burrell and Morgan's framework as an intellectual map to depict the conceptual basis and the underpinning ontological/epistemological assumptions of the selected literature (Burrell and Morgan 1979).

3. - Literature Review

The results of the literature review are shown in table 1. The columns of the table indicate, in the given order:

- the name of the area where the paper is classified. The names are derived from the Journal Quality List (Harzing 2007);
- the number of papers classified in each area;
- the number of papers adopting a partial approach to BM research;
- the number of papers adopting a holistic approach to BM research;
- the number of papers giving a micro definition of BM;
- the number of papers giving a macro definition of BM;
- the number of papers giving no definition at all of BM.

<table>
<thead>
<tr>
<th>Area</th>
<th>Number</th>
<th>Partial</th>
<th>Holistic</th>
<th>Micro</th>
<th>Macro</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations Research, Management Science, Production &amp; Operations Management</td>
<td>14</td>
<td>10</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Management Information Systems &amp; Knowledge Management</td>
<td>13</td>
<td>4</td>
<td>9</td>
<td>3</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>General and Strategy</td>
<td>12</td>
<td>7</td>
<td>5</td>
<td>4</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Innovation</td>
<td>10</td>
<td>9</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Economics</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Sociology</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
The columns Partial and Holistic represent the position of the paper in the field of BM research. Papers adopting a partial approach are assumed not to recognize the multidisciplinary character of this area of interest: as a result these papers do not cite literature relevant to the BM term or limit their citations to the field of their interest. Contrary to this approach, papers adopting a holistic approach perceive the need to find more solid foundations of the BM concept and try to define theoretical frameworks on the base of established literature overpassing the boundaries of the referring discipline. The Micro, Macro and None columns represent the characteristics of the definition of the BM term in the selected papers. A definition indicating components of a BM, their characteristics and their relation is defined Micro, whereas a definition briefly describing what a BM is (in the form of one or more short sentences), is defined as Macro. This distinction relies on the assumption that a Micro definition is more precise than a macro one.

3.1 – Literature analysis

Table 1 shows that not all the areas are equally represented in the sample. The most relevant are those related to Management (first and second row), Strategy and Innovation, followed by the Economics area. The rest of the table is occupied by areas containing only one paper. These results reflect the main use of the BM term which is usually referred to the possibility to obtain value from a technology (commonly an Information or Communication Technology).

Looking at the total row of table 1 it can be said that about 65% of the papers in the sample adopt a partial approach to the research: this means that the majority of selected contributions do not perceive that this area of research is of interest for many disciplines. Another consideration can be formulated on the base of the nature of the given definition of BM. It has to be noticed that about 50% of the papers in the sample do not give a proper definition of the object of study. Not all the areas show the same behaviour against the object of study. Even if the majority adhere to the profile
that has been drawn, Management of Information Systems & Knowledge Management and General and Strategy distinguish themselves for a larger presence of holistic approaches.

The dimensions identified and analysed in table 1 can be used to draw a qualitative positioning map which can help in interpreting the collected data. The qualitative map proposed here confronts the approach of the paper against the rest of the literature (Partial/Holistic) and the type of the definition of the BM term (Micro/Macro/None). These two dimensions are represented over two axes forming the following positioning map.

<table>
<thead>
<tr>
<th>Micro/Macro definition</th>
<th>Holistic</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td></td>
<td>C</td>
</tr>
<tr>
<td>C</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>No definition</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To draw the map, the Y axis has been formed transforming the second dimension of analysis (the type of definition) to make it dichotomous. The positioning map forms four different quadrant which have been named from A to C.

The D quadrant includes papers which do not give a definition of the term BM and, at the same time, adopt a partial approach. This quadrant hosts papers in which the BM term is used in a generic way. It can be the case of papers that do not perceive the need to clarify the term or use it as a synonymous of strategy or value generation.

The C quadrant includes papers which adopt a partial approach to the research but, at the same time, give a proper definition of the term. This quadrant hosts papers in which the BM term is analysed from the point of view of only one discipline.

The distinction between quadrant A and B is not that sharp. Quadrant B includes papers which adopt a holistic approach but do not give a definition of the term: this quadrant hosts papers who try to stabilize the area of research of BMs. Finally, quadrant A includes papers which adopt a holistic approach and give a (more or less detailed) definition of the term: this quadrant hosts papers who try to make progresses in the area of research of BMs.
Table 2 illustrate the distribution of the selected papers into the four quadrants of the positioning map.

<table>
<thead>
<tr>
<th></th>
<th>Num</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations Research, Management Science, Production &amp; Operations Management</td>
<td>14</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Management Information Systems, Knowledge Management</td>
<td>13</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>General and Strategy</td>
<td>12</td>
<td>5</td>
<td>-</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Innovation</td>
<td>10</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Economics</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Sociology</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Organisation Behaviour/Studies, Human Resource Management, Industrial Relations</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Marketing</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Finance and Accounting</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Communication</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>58</strong></td>
<td><strong>14</strong></td>
<td><strong>6</strong></td>
<td><strong>13</strong></td>
<td><strong>25</strong></td>
</tr>
</tbody>
</table>

The new classification in table 2 shows how the papers are distributed among the four quadrant of the positioning map. The total row indicates that the D quadrant is the most frequent in the sample. The D quadrant was said to contain papers which uses the term in a very generic way or which do not perceive the need to give a proper or more detailed definition of what a BM is. This is very much the case of the papers that are classified in this quadrant as most of them are related to the definition of a BM in a specific sector (see for example Anson 2006, Roger 1998 and Nosella et al. 2004) or simply use the term in a very generic manner, as a synonymous of strategy or value generation (Chan-Olmsted and Ha 2003). Given the aim of this paper the quadrant D does not contains useful information on methodologies to be used to define a BM.

In the C quadrant there are 14 papers. In general these contributions try to use the BM as a tool or as a lens to analyse different phenomena. In comparison to those contributions classified in quadrant D, these 14 papers perceive that the term is often used in an imprecise manner (O'Hare 2006) and try to develop a more concise concept of BM (Voelpel et al. 2005, Tikkanen et al. 2005).

A relevant contribution in this quadrant is the one by Timmers (Timmers 1998) which is one of the
first article (under a chronological point of view) which tries to define a taxonomy of available electronic BMs. Anyhow, contributions in this quadrant suffer from the partial point of view and limit their analysis only to their discipline of pertinence.

All the papers classified in the B quadrant have an attitude towards the stabilization of the BM research. In this quadrant there are contributions who try to develop frameworks (Pateli and Giaglis 2003), to define the BM term and distinguish it from the strategy (Seddon et al. 2004) or to look at the theoretical foundations of the BM research (Hedman and Kalling 2003). The intent is always to stimulate progresses in this area of research.

Finally, among papers classified in the A quadrant, there are two that are of major importance given the objective of this work. These two contributions (Gordijn and Tan 2005, Osterwalder et al. 2005) introduce two different ontologies in support of a BM definition process. These two contributions represents the most advanced stage of research in BM definition as they introduce formal languages to be used to describe a BM and its components.

Further considerations can be formulated confronting the conceptual basis and the underpinning philosophical assumptions of the selected literature using the Burrell and Morgan's framework (Burrell and Morgan 1979). The analysis of the literature with this framework shows that the interpretative paradigm is prevalent, suggesting the existence of a common ontological and epistemological approach that can group the contributions coming from different disciplines. The prevalence of interpretive paradigm is typical in new and not well known fields and the BM research, under the point of view emerging in this paper, seems to fit perfectly in this definition. The prevalence of interpretative paradigm could be a possible explanation for the abundance of partial approaches, as interpretations rely on subjective judgements and these may easily diverge.

Given Burrell and Morgan's framework limitations (Dhillon and Backhouse 2001), it is not so important to give too much emphasis to the distinction between interpretive and functionalist paradigm in BM research, as a result of the confrontation of objectivism versus subjectivism which is at the very base of the Burrell and Morgan's framework. Under an epistemological point of view, moving from the object to the meaning, and adopting a constructionism epistemology, it is not a matter of diverging interpretations but of “useful” or “useless” ones, that is to say, able to serve a specific scope (Crotty 1998). It is under this perspective that the methodologies identified from the literature review can be applied to real contexts.

3.2. - Business Models research in Telecommunication related topics
To see the relevance of the topics addressed in this paper, in the present paragraph the methodology adopted previously will be applied to contributions studying BMs in the Telecommunication sector: these contributions have been selected from the websites of the past editions of the European Regional International Telecommunication Society conferences. This analysis may contribute to show the relevance of the problem in the telecommunication sector, as well as to validate the framework of analysis.

Table 3 shows a selection of papers presented in past conferences: these papers have been chosen and analysed because they address topics closed to the BM research. The total row in the table shows that the Partial approach is still prevalent as well as the absence of a BM definition, confirming what has just been said concerning the literature on Business Models.

With the exception of (Kijl et al. 2006) and (Zarnekow and Brenner 2007), who include in their papers a small literature review on BM, all the other selected papers do not search the literature to identify the definition of the BM term. Anyhow, even in this small sample, the need to have a proper definition of the BM term is perceived by some authors (see for example Bowman et al. 2007 and de Reuver et al. 2007) who recognize that the literature on this topic is very confused.

<table>
<thead>
<tr>
<th>Area</th>
<th>Partial</th>
<th>Holistic</th>
<th>Micro</th>
<th>Macro</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhule and Reichl 2997</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Poel et al. 2007</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Ballon et al 2007</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Rendon et al 2007</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Zarnekow and Brenner 2007</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Bowman et al. 2007</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>De Reuver et al. 2007</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Kijl et al. 2006</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Song 2004</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Villaverde et al. 2001</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>

Tab. 3 – Papers from past editions of ITS conferences

4. - Business Model definition methodologies

The literature review contributed to highlight two research contributions that introduced two different conceptual tools to define a BM. These two contributions adopt an ontology based
approach to derive a shareable conceptualization of BM. Ontologies use, in the past, was restricted to philosophy-related research fields, but nowadays they are used as generic instruments to represent and exchange knowledge (Guarino 1998). In the field of BM research ontologies are proposed to overpass the difficulties connected to the absence of a referring definition. The two ontologies introduced to support business modeling are: the Business Model Ontology (Osterwalder et al. 2005) and the e3-Value Ontology (Gordijn and Tan 2005).

4.1 – The Business Model Ontology

The Business Model Ontology (BMO) is introduced in order to systematize and summarize all the contributions related to BM research and all the definitions available in literature. According to what the BMO says, a BM is defined as a “conceptual tool that contains a set of elements and their relationships and allows expressing the business logic of a specific firm. It is a description of the value a company offers to one or several segments of customers and of the architecture of the firm and its network of partners for creating, marketing, and delivering this value and relationship capital, to generate profitable and sustainable revenue streams” (Osterwalder et al. 2005).

The BMO represent a BM as composed of four main pillars: Product, Customer Interface, Infrastructure Management and Financial Aspects. Every pillar is composed by one or more Building Blocks (the structure of the BMO is depicted in table 4). Each building block can then be composed by a set of elements. Relations and cardinality among pillars and building blocks is defined in the ontology and is not reproduced here because it is not necessary for the aim of this paper.

The structure of the BMO enable its use at different levels of abstraction. The BMO can be used to obtain quick representation (the so called bird eye view which includes only pillars and building blocks) or full representation of a BM (which include pillars, building blocks and all the other atomistic elements).

<table>
<thead>
<tr>
<th>Pillars</th>
<th>Building Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td>Value Proposition</td>
</tr>
<tr>
<td>Customer Interface</td>
<td>Target Customer</td>
</tr>
<tr>
<td></td>
<td>Distribution Channel</td>
</tr>
<tr>
<td></td>
<td>Relationship</td>
</tr>
</tbody>
</table>

Each element in the ontology has properties and relations with others. The set of relations among all the elements form a guidance in the BM definition process. Starting from the Value Proposition (usually the core element of a BM), the ontology clarify which are the other elements connected to it, and guides towards the completion of the definition process.

### 4.2 – The e3-Value Ontology

The e3-Value Ontology (Gordijn and Tan 2005) aims at identifying exchanges of value objects among actors in a business case and supports profitability analysis. The ontology contains a simplified set of concepts that should be easily used by users to model the reality of their interest.

The e3-Value Ontology includes some base constructs and defines linkages among them. The constructs are: Actors (an independent economic entity), Value Objects (objects, like services, goods or similar exchanged among actors), Value Ports (used by an actor to show its willingness to exchange value objects), Value Interfaces (a set of individual Value Ports offering or requesting value objects) and Value Exchanges (represents a potential trade of value objects between value ports). The constructs are linked by different elements: Dependency Elements, Connection Elements, Stimulus Elements, AND/OR Connection Elements and Value Interfaces revisited.

The constructs and their linkages in the e3-Value Ontology can be used to model a Value Network, composed by different actors that exchange values in a BM. After having modelled the Value Network, the e3-Value Ontology can then be used to carry out a profitability evaluation of the network and, therefore, of the BM. Each construct has its own graphical representation and a design tool can be used to graphically represent the BM. The design tool also supports the profitability evaluation.

### 4.3 – A Comparison of the two ontologies
Even if the BMO and the e3-Value Ontology aim at the definition of a BM, they adopt two different perspectives that make each of them be suitable for different purposes.

Under a theoretical point of view, the BMO relies on the Resource Based View of the firm (Wernefelt 1984) and thus identify in the resources controlled by the firm the source of the value generation. The BMO has then to be applied to the BM definition process of a single entity, which maybe, anyhow, part of a network. Moreover the BMO highlights the internal structure of the BM and models the part of the organization that is interested by the value generating process. This ontology can then be useful to share the same concept of BM among stakeholders involved in a BM definition process in an organization.

The e3-Value Ontology, on its side, relies on the value chain framework and, particularly, on its extensions (Porter 1985, Porter 2001, Stabell and Fjeldstad 1998). The Value Chain indicates the activity each firm has to performs to deliver value to the market, whereas the Value Network (an extension of the Value Chain framework) identify in the interconnections among customers the source of value. As previously indicated, the e3-Value Ontology has to be used when different actors are joined and form a network.

In order to grant interoperability among the two ontologies there are research contributions that try to identify overlaps and contact points between them (Gordijn et al. 2005). Authors defined an equivalence schema that can be used to establish the equivalence among constructs of the two ontologies, in order to make BMs defined with the two different conceptual schemas interoperable. Anyhow a true interoperability among the two ontology, that could be achieved with a domain or a reference ontology, is still missing.

5. - Conclusion

The BM is a term commonly used, both in research and in the business practice. In spite of the great interest of the term there is not so much shared understanding of what a BM really is and how to define it. This circumstance can be risky in contexts where the BM has to be defined by different actors (or stakeholders) because each of them may refer to its own concept of BM and they may misunderstand one another.
The need to share a common concept as well as a methodology to define a BM emerges both from the research and the practice. Literature on the topic is very abundant but, at the same time, very confused.

In order to answer these needs, the present paper introduces a literature review that helps in the identification of established conceptualizations and methodologies for the BM definition that are available in literature. The literature review identifies two approaches as the most relevant: the BMO and the e3-Value Ontology.

Reference


