Modelling Value Delivery and Organizational Capability Building in the Hungarian Web Agency Industry\(^1\)

András Nemeslaki  
Corvinus University of Budapest, Hungary  
andras.nemeslaki@uni-corvinus.hu  
Dániel Füleki  
Corvinus University of Budapest, Hungary  
Zsolt Theiss-Balázs  
Corvinus University of Budapest, Hungary

Abstract
Web agencies are firms which develop web based models for companies. These models vary from simple web pages through on-line marketing techniques all the way to full process integration to payment solutions. The operation of web agencies raise several dilemmas: for instance how pricing of such services are set, what type of technology they use and what type of carrier path they provide for the job market. After looking into the question in Hungary we realized that there are several questions unanswered regarding the web development industry. First, there is no information about the market in terms of the number of companies and their impact on e-commerce in Hungary. Secondly, we have no information on how technology is organized and aligned for value creation in this industry. In our research we explored the Hungarian web agency industry in terms of the numerical size of the market, structure of value creation activities and how technologies together with HR skills create organizational capabilities for web agencies.

Keywords: Web agency, value delivery, web development, organizational capability

1. Introduction
Internet consumption has become more and more significant during the last years in Hungary. In 2010 the number of internet users – that is the individuals who spend at least 1 hour daily with internet activities – reached and exceeded 50% amongst the population over 14 years (Kis, 2010). This number is over 3.6 million individuals in Hungary which is over 40% of the total population of the country.

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A lot of these users have been engaged in commercial activities. In early 2010 about 1,075,000 Hungarians reported that they have been using electronic commerce and approximately the same number has indicated that they are open to this channel and plan to use e-business services in the near future (Kis, 2010).

This consumer demand has been served by 2700 web shops and portals which number does not include e-travel and e-insurance. These companies have generated over 360 million Euros revenue in 2009 and around 475 million a year later (Kis, 2010). One could say that e-commerce is still contributing very little to the total volume of retail in Hungary – about 1-5% - but the growing figures of the electronic channel dominance indicate a gradual restructuring in the industry. This can be underlined firstly with the fact that total retail has not grown in volume in the last 5 years in Hungary, while B2C e-commerce has produced around 20% growth in the same period slowly shifting retail into this direction. Secondly, the significance of B2C commerce can be observed that in the worst year of the economic crises from 2008 to 2009 the volume of e-commerce has grown more than 30%.

2. Web agencies as the key drivers of e-business – the focus of the study

E-commerce is growing both in supply and demand and this growth needs to be served by an industry which did literally not exist 5-10 years ago. This is the industry which we call in our research web agency ecosystem but these companies are also known as web development or web design firms. They can be defined as the providers of the nuts-and-bolts of internet presence for their customers from domain registration to graphical design all the way to the development and implementation of complex back-end processes. It is interesting to notice, that we know more and more about the internet consumers and electronic commerce firms but there has been much less attention paid to web agencies which service these e-commerce companies.

What we have known in Hungary, mainly from causal observation, single cases and narratives of participants is that the focus of web agencies is website development, graphical design and basic functions of browsing. From this point of view one of our colleagues has called them the “grey eminent” of the web industry, those who work in the background, unnoticed, and determine most everybody’s internet experience.

Web agencies more and more frequently offer integrated business models from product catalogues through order placement to payment solutions. From experience we know that some of these companies are focused; for instance on on-line marketing and search engine optimization (SEO), at the same time some others are very general offering complex process consultation to streamline their clients’ e-strategy. Some of these companies are big both in revenue and in size of employees (at least 20-30 developers working according to complex work processes and position structures), while others are just a one-person-shop created by an astute university student who throws a couple of web pages together in one or two nights for a friend.

Besides the general growth of e-business in Hungary, this industry has become interesting to us for two other reasons. Firstly, at least 20-25% of the graduates of our information system program - and a less known but still significant number from other business programs – have been working for these agencies or have created their own over the last five years. Given their feedback we found solid evidence that information management education will serve much better the local business needs if students are provided with information about how these companies work, what type of carrier opportunities they offer, or what the key success factors are to set up such agencies.
Secondly, information about web ecosystem characteristics is getting more important for keystone companies to create effective strategies. According to Iansiti and Levien, keystone organizations play a crucial role by providing stable and predictable assets to other organizations in the ecosystem enabling them to build their own offerings (Iansiti & Levien, 2004). Empirically, this has been brought to our attention by Microsoft Hungary, a leading keystone, which provides its operating systems and tools for third party organizations. Our team constructed a research design and plan to find out how technology deployment and lock-in may support Microsoft’s keystone strategy, and then generalized this inquiry to provide a description about the Hungarian web ecosystem (Füleki, Theiss-Balázs, Balkányi, & Pocsarovszky, 2008).

By combining the two research motives our exploratory study has focused on three main sources: information technologies, development methodologies and human resource data in web agencies. The various combinations of these resources form organizational capabilities which determine the value propositions of web agencies. We would like to underline that these propositions are important considerations not only for the keystone strategies but for the web agency’s customers as well.

Our research topology is shown in Figure 1. in which describe how web agencies are positioned between technology suppliers and customers. Our research interest has been to open up the middle box of in Figure 1. And investigate how value is transferred from technology suppliers to customers.

Firstly, we investigated the size of the web agency industry and their relevance to the Hungarian internet. Our assumption was that a relatively few companies provide high dominance in the market.

Secondly, in order to be able to conceptualize how capabilities are configured to create value for customers we developed and tested a general value delivery model for the industry. For constructing this model we used three concepts; a) Porter’s value chain (Porter, 1985), b) the classic resource based view (RBV) by Wernerfelt (Wernerfelt, 1984) and its application to information systems (Wade & Hulland, 2004), and c) the information system development lifecycle (ISDL) concept (Laudon & Laudon, 2010). The choice of these three concepts can be explained as follows:

The role of ISDL logic is explained by empirical observations: the key focus of web design companies are delivering and enhancing portal solutions to their clients. The value chain and
RBV approach was derived from the keystone strategy logic as we outlined the problem in the research motivation part earlier (Iansiti & Levien, 2004). We then examined how the combined model functions with empirical data collected from Hungarian agencies.

Thirdly, we explored what type of key technologies are deployed along the value delivery chain of web agencies, and how these technologies combined with human resource skills and functions get configured for value creation.

Finally, we tried to arrive to general conclusions and define further questions about organizational capabilities in the web agency industry in Hungary, in order to come up with recommendations both to suppliers and customers.

3. Mapping the web agency industry in Hungary

In order to find out how large the web agency population is in Hungary we developed a search method using a programmed web crawler. The crawler was programmed to search more than 11,000 websites in Hungarian domain names and collected data about the references and quality of agencies who designed those sites. References were name, address, phone, e-mail and geographical location of the agencies which data was later used for further and detailed questioning.

For determining the relevance of each agency we programmed the robot to collect quality measures of Google Page Rank (GPR), MSN index (MSN), Yahoo index (YI) and Alexa rank for all the 11,000 websites. Our assumption was that these measures indicate how well a site is working from consumer point of view both in terms of significance and effectiveness (Palmer, 2002). Naturally, other measures could also be used, but given the fact that our study had no predecessor we would argue for these indicators as a first choice or first best indicator which in later research can be refined.

From these search indexes we developed a combined index for each visited site and their average value determined the performance index of the creating web agency. This calculation is illustrated in Table 1.

In Table 1 we show Big Fish which is a known web agency in Hungary. Our crawler indicated its identified clients in the table and collected the performance index of these sites (GPR, YI, MSN) of which a combined value was calculated and shown. In the case of “libri.hu” this value is relatively large confirming the fact that it is the one of leading on-line book selling site in the country and so is the second “bortarsasag.hu” which is an e-shop selling brand wines. The average combined index of the five sites provides the performance value of the Big Fish agency which is pretty much confirmed by our experience and knowledge about this particular company.

Table 1. illustrates that an agency can reach a high relevance score by designing many sites (in our database this varies) or by designing a few with high performance index.
Table 1: Combined Performance Index of Web Agencies

<table>
<thead>
<tr>
<th>Sites</th>
<th>Indexes</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big Fish (web agency)</td>
<td>12.412</td>
<td>Average combined index</td>
</tr>
<tr>
<td>Libri.hu</td>
<td>28.122</td>
<td>Combined performance index</td>
</tr>
<tr>
<td>Bortarsasag.hu</td>
<td>11.794</td>
<td>Combined performance index</td>
</tr>
<tr>
<td>Case.hu</td>
<td>5.765</td>
<td>Combined performance index</td>
</tr>
<tr>
<td>Notebook.hu</td>
<td>4.087</td>
<td>Combined performance index</td>
</tr>
<tr>
<td>Rd.hu</td>
<td>3.230</td>
<td>Combined performance index</td>
</tr>
</tbody>
</table>

The relevance and market significance of an agency, in our opinion, is characterized substantially well enough by the performance indicators of their clients; the quality and effectiveness of any business model is eventually justified by how good the web performance is. Naturally, it is also important to look at financial indicators and profitability data but at this exploratory stage of our research we postponed this investigation to a succeeding stage.

The final result of the crawler search method collected 950 web agencies in the Hungarian market with the geographical distribution illustrated in Figure 2.

![Geographical distribution of Hungarian web agencies](image-url)

**Figure 2:** Geographical distribution of Hungarian web agencies (Füleki, Theiss-Balázs, Balkányi, & Pocsaroszky, 2008)
To conceptualize this result, we also attached Figure 3. to show how this distribution visually connects to the geographical development of the Hungarian ICT development. Most agencies are located in the developed areas in Budapest the capital and Central Hungary. We can also see by comparing the two maps that location of a web design firm is not always connected to the regions IT development, since we have agencies in Eastern and Southern Hungary, while we have found relatively few in some of the Western regions.

The second major finding of the crawler search is depicted in Figure 4. which shows the ranking of agencies according to their combined performance index.

This chart shows that from a performance point of view - or web appearance relevance point of view – Hungarian agencies clearly show a long tail characteristics (Anderson, 2006).
There are around 100 agencies constituting about 80% of visibility on the Hungarian web ecosystem and the rest 850 some companies cover the remaining 20%.

This phenomenon is matching our professional experience from the market since the head agencies are definitely more relevant in professional conferences, implication of their work and the wide range of their designs. Tail companies, as we know them, are more focused, smaller in size and more specialized for particular niche technologies and clientele.

Throughout the paper we look at differences of head and tail since our assumption is that these two segments behave differently given their relevance to e-business.

As a next step we surveyed 800 agencies those ones where we could verify the reference data (address, e-mail etc.). At the same time detailed in-depth interviews were carried out with 11 agencies which results were used for the development of our value delivery model presented in the next section of our paper. This model then was tested with the survey from which 159 responses were returned resulting in a 20% response rate which described about 17% of the estimated total population (950 agencies). From the 159 survey responses we identified 34 head and 125 tail web developers.

The 11 interviewed agencies were selected based on their relevance to the market and openness for discussion. 7 of them were from the tail segment of the market and 4 of them were head companies. Interviews were running parallel with the survey so we presented and verified our raw data findings during this process.

4. Value Delivery Model for Web Agencies

For conceptualizing the value delivery structure of web agencies we propose the recently widely discussed resource based view theory (RBV) (Wernerfelt, 1984), (Barua, Kriebel, & Mukhopadhyay, 1995), (Barua, Konana, Whinston, & Yin, 2004), (Melville, Kraemer, & Gurbaxani, 2004). As Figure 5. illustrates that value according this theory is created by combining ICT tools and capabilities with other organizational resources – such as management skills, organizational structure – which then create a competitive advantage by the unique configuration. Literature says, this advantage is sustainable if the configuration is difficult to be imitated either because of the unique technology/skill set or because of the special organizational characteristics of the value delivery (Wernerfelt, 1984), (Melville, Kraemer, & Gurbaxani, 2004).

Chatterje developed a pragmatic application of RBV for mapping value delivery by refining the general concept (Chatterje, 1998). We illustrated his model also in Figure 5, which Chatterje used to the modeling of Dell’s value creation. He described how resources create value through procedures which lead to outcomes recognized by the market which then in return might be real value compensated in revenue streams. This is the so called inside-out strategy which we also applied in our model for the Hungarian agencies.
It is not the topic of our paper, but Chatterje also demonstrated that this logic works the other way as well; market requirements imply the value for which cash can be obtained, which determines what sort of outcomes have to be generated by the procedures and finally what kind of resources are needed for the execution of those processes. This is the outside-in logic or market driven value delivery which determines the best resource configuration to maximize customer satisfaction and revenue.

Porter’s value chain model helped to define the primary value creation activities and the support ones. The importance of the value chain theory was confirmed during the interviews when it has become clear that web agencies treat these set of activities very differently. For instance it looked like a major difference between head and tail companies how much attention they were given to the support and to the different primary value creating activities.

The third conceptual driver of web agencies’s value delivery is the principle of IS – especially software – development. We should have in mind that the final outcome of web development is usually a web page supported by databases and processes quite often combined with some hosting infrastructure. To reach these outcomes and deliverables the classic steps and the whole paradigm of software analysis and design is applicable as it turned out from the interviews and also by our experience. Figure 6. summarizes the main steps both of classic ISDL and the steps of prototyping (Laudon & Laudon, 2010). The arrows in the classic ISD chart indicate that at each step there is a quality check with the organization ensuring that the delivered system is in alignment with organizational objectives. Prototyping is important because web development is very reliant on customer feedback, speed and interface design. Experience shows that it is accompanied by heated argument and debates of “faith and believes” especially in the area of graphic design and outlook. That is why prototyping and rapid development techniques serve as an important basis for web value delivery.
By putting these concepts together we constructed the web agency value delivery model depicted in Figure 7. The general idea behind Figure 7 is to visualize the value creation logic and ISDL in one integrated map. We have chosen this structure for an easier interpretation of our empirical findings but it is important to note that further validation of such a structure might be necessary. In our paper we offer it as a “mind-map” for web agency operations.

As we can see the primary activities of our model follow the logic of classic ISDL with analysis, design, development and implementation in the core of primary activities. This core is amended with the special on-line marketing function which was identified as a special value element of web agencies. Especially, in B2C models we know the importance of visitations, page downloads, unique site visits and conversion rates. During the interviews it has become clear that the modern techniques of SEO, on-line advertisements, site
performance measurement, banner design are primary values for many clients developing web based models.

Interviews also made it clear that project management should be considered as a primary value creating process, since each web model, and each client relation has distinct project features characterized by well defined scope, deadlines and resource allocation requirements. Also designs and models should be treated as unique, not repetitive applications even if they are built from standard blocks or already developed modules. Clients value these uniqueness and differentiation, it is quite important for their business success. These are the key reasons why we placed PM amongst the primary activities of our value delivery model.

Amongst the support activities infrastructure management and the importance of HR was highlighted during the interviews. These are areas cut across all the primary activities infrastructure for instance determines how design and development is being done and how these activities are supported by personnel management, recruitment and motivation.

The existence of these functions and their difference in the head and tail agencies are summarized in Figure 8. and Figure 9. based on the 159 survey responses.

Figure 8 and Figure 9 show that all the value delivery activities exist and head and tail – smaller and bigger – agencies do not seem to very different from this point of view. Strong value propositions can be identified in design (architectural and graphical), development and on-line marketing. These areas suggest typical web performance specializations since all web pages have to have these elements.

**Figure 8:** Value Delivery Activities in the Head Agencies
Figure 9: Value delivery activities in the Tail Agencies

In the overall situation companies focus less on analysis, implementation and support. The combination of these three value delivery functions suggest – what is also confirmed in the interviews – that most companies do “quick-fix” solutions without too much resource allocation on conceptual investigation and analysis of business problems itself. This looks like the case both for head and tail agencies, since 34% of head and 48% of tail companies do not have any resources allocated to this area.

Implementation and support on the other hand is somewhat different between the head and the tail since in the head there are 27% and 23% do not have any focus on this area while in the tail the same values are 38% and 36% respectively.

Project management seemed to be a critical value delivery item in the web agency industry; in the total sample 35% of companies did not have resources on this function with 15% of head design firms and 24% - that is almost every fourth – of the tail ones basically neglecting this function as a value delivery function.

Even at this stage of our analysis, the value chain suggests interesting insights to the potential opportunities and potential causes of problems in this industry. It seems that there are vast number of suppliers in the Hungarian web ecosystem which provide solutions to clients, The general focus seems to be design and development – in these areas customers might expect serious competition. On the other hand, in the areas of problem analysis functional support and implementation web agencies might gain advantage compared to each other. The lack of attention on PM is quite often expressed in stumbling customer relations, deadline prolongation, difficulties in scope setting and internally keeping the development team aligned through the length of the project. Several of these issues were raised in the interviews and suggested both a threat and an opportunity for better customer service.

5. Technology and capability in the value delivery model

Organizational capabilities, according to the resource based view, are created as a combination of human and technology resources together with the working methods as they are working together (Prahalad & Hamel, 1990), (Teece, Pisano, & Shuen, 1997). Based on the 159 returned surveys we may provide a description of what type of key technologies are
deployed along the value chain, and how do they create organizational capabilities in this industry (Teece, Pisano, & Shuen, 1997).

Web agencies are very much technology sensitive and as interviews and survey data show they require continuous learning and always careful attention on technology assessment and choice. Figure 10, depicts the findings regarding the general skills and educational background of employees. As we can see, the majority of respondents have college degrees (BSc, MSc) but more than 80% of respondents acquire their specific skills for the job through self learning; internet search, books, on-line forums.

![Educational background in Hungarian web agencies](image)

**Figure 10:** Educational background in Hungarian web agencies

### 5.1. Technology in the primary activities

Let us start our examination with analysis about which we observed in Figure 8. and Figure 9. over 40% of agencies do not have any activities in this area. If we expand this view in more detail we find that those who are involved in it, they basically focus on the “absolute must”. This is shown in Figure 11.
We classified analysis into two main categories, external and internal orientation. External analysis contains industry analysis, consumer analysis and best practice overview. Industry analysis examines the entire value chain of the customers industry and attempts to map the key stakeholder relationships in order to support business modeling. Internet consumer analysis describes the behavior of the customers’ clients; who are the major users of the model, what is their demographic description and internet usage pattern, etc. Best practices demonstrate what particular leaders do regarding their web applications which can be considered as examples to follow and imitate. In Figure 11, we can observe that of these methodologies this last one is used the most while complex industry analysis is the least.

Internal analysis focuses on customer only and intends to provide guidelines for design from the customer’s processes. IT readiness describes the technology adoption level and knowledge of the company, while stakeholder analysis lists the key expectations from internal players in the organization. Website analysis which is used by more than 80% of our respondents is an important method to find out how a particular design “functions” with different user groups. A lot of website analysis tools are automated like click-stream and login analysis, but often questionnaires and user tests are also applied. Critical success factor is identically popular as website analysis and tallies all the risk and opportunities of the particular web design and lists those items together with their measurements which determine how good the model under development will be.

In Figure 11, we again concluded that there is no difference between small and large design firms, according to common sense expectation; all the methods are applied both in the head and the tail.

Technology deployment in the design phase is shown in Figure 12. Figure 13.

Graphical design is fairly standard; Adobe products make up 80% of design tools indicating a major lock-in in this field. The verb “to photoshop” has become as common to describe picture editing as “to google on something” has become for general search. And not only in English but also in Hungarian.
Architectural design survey data has two interesting conclusions in the Hungarian ecosystem. The first is depicted in Figure 12, which demonstrates that the Hungarian design firms mainly trust their own code and apply low cost and free technologies. During the interviews with experts and managers this has been confirmed several times with exposing disgust and frustration about finding out and scribbling others’ codes and struggle with innovations from other organizations.

The second interesting conclusion we might have by looking at Figure 13, that a lot of design firms – especially in the head – work with “low” technology (bandwidth and processing capabilities). For understanding the relevance of that we refer again to the ICT development map Figure 3. of Hungary which illustrate that several minor regions in the country have low level ICT adoption and low level broadband access, so successful e-business solutions should take this into account. We argue that web agencies reflect this response for the architecture design.

Development was classified into two main categories front-end and back-end development. Front- end technology solutions are focusing on the client side and user experience while...
back-end covers those solutions which are not visible to the users and several time cover processes of the server side of web development. Our findings are shown in Figure 14. and Figure 15.

![Figure 14: Development Technologies - PHP, HTML, CSS are the must](image)

HTML and CSS are considered as a must for website development, it is no surprise that most firms have intensive use of these technologies. At the back-end development we can see a clear dominance of PHP-code, mySQL and self developed content management systems (CMS). These data confirm our observation at the design phase for open source and self development.
At the implementation phase our survey shows that documentation seems to be a critical area; 121 respondents out of the 159 do not document their testing. This is especially risky in connection with the fact that most design and development is carried out with open source and self development.

Another, somewhat alarming data about the operation of web design is that almost 70% of our sample spends less than 10% of their development effort for testing (Figure 16). From this information it looks like extra value can be created by more thorough testing, or at least this is an area for improvement (opportunity for improvement).

Our survey results show the major difference between head and tail companies in Hungary in the area of on-line marketing. Figure 17. shows that head agencies are more familiar with
adserver technology, and tail companies are much more familiar with SEO. This has been explained in the interviews with the fact that SEO is dealt with niche agencies quite often specialized only to this area.

![Figure 17: On-line marketing capabilities](image1)

Figure 17 even more figuratively demonstrates that tail companies are not using adserver technology (80%) but they are more widely applying adwords which are considered as SEO application.

![Figure 18: On-line marketing technologies - difference between head and tail](image2)

On-line marketing offers in Hungary the major opportunity difference for smaller design firms given its special nature and unique required skill set.
5.2. Capabilities in the support activities

Our survey shows that web agencies mainly use hosting services and less frequently run applications on their own servers, the interviews confirmed that there are more and more mature and reliable hosting services available. System administration is a key function only 42 out our sampled 159 companies did not have such positions.

Our inquiry about HR motivations, shown in Table 2, suggests that Hungarian web agencies presently offer hard work and very little of the big companies’ motivational perks. The major incentives in most companies are performance based premium and base salary. A very few agencies (5-8%) offer company cars and other “high class” motivation. HR’s relative infancy of this industry is also shown in Figure 19, which indicates that 70% of companies do not have a planned carrier path and probably for this reason they do not measure work performance at all.

Table 2: Motivation in web agencies

<table>
<thead>
<tr>
<th>Major incentives</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance-based premium</td>
<td>115</td>
<td>71.88%</td>
</tr>
<tr>
<td>Base salary</td>
<td>96</td>
<td>61.25%</td>
</tr>
<tr>
<td>Company Mobile</td>
<td>42</td>
<td>26.25%</td>
</tr>
<tr>
<td>Cafeteria</td>
<td>26</td>
<td>16.25%</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
<td>9.38%</td>
</tr>
<tr>
<td>Sport</td>
<td>13</td>
<td>8.13%</td>
</tr>
<tr>
<td>Company Car</td>
<td>8</td>
<td>5.00%</td>
</tr>
</tbody>
</table>

Figure 19: Carrier planning in web agencies

6. Conclusion

Although our research was exploratory in nature we believe it offers several interesting conclusions for the technology suppliers and also for the web agency customers.
For technology providers our findings show that it is really difficult to achieve an effective lock-in. Most Hungarian web agencies are using open source and own development due to low cost and more flexibility. Also HR data showed rather a “garage” mentality that is hard work and relatively low compensation with high risk in carrier success.

For customers who want to get competitive web based models developed we have several messages. Regardless of the lower consumer IT level of Hungary there is a large web agency market out there with a large functional variety.

Amongst these we can find specialized firms which offer niche development, focus on design, marketing or implementation processes. It is important to note that web design is not only graphics and infrastructure but the industry offers a complex value delivery system which in principle determines the final costs of internet based model development projects.

Our survey shows that project management among those value creating activities proves to be a high risk element and also the nature of the open source and own development. This might create lots of dependencies of customers on web agencies with difficulties to switch in case they want to change web design.

Given the relative infancy of the industry only a few companies offer balanced value delivery that is creativity, process, quality and also intensive research. Most companies offer specialization to customers and therefore they have to be aware of the limitations of these. We consider our work as a step toward the mapping of the relatively new industry which has a vital importance for the growing internet economy in Europe.

We see several extension opportunities such as exploring network interrelations between agencies and customers for exploring a networked value model in the web ecosystem. Then the examination of capability maturity might be interesting to see how value delivery could be elevated to the next level of organizational capability.

Finally, we offer our findings for information management programs in which students are prepared to work in this industry. The findings of the survey can be used to draw attention on opportunities and also on threats for professionals or applicants planning a carrier in this industry.

References


