

# Global market opportunities: analysis of the foreign language websites in the Czech economy in the context of the number of it professionals

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**Abstract.** This paper analyses the use and management of web portals of the Czech industries. This paper investigates which industries have the highest shares of foreign language portals. This share is compared to the number of hired IT professionals. This paper is based on the thesis that competing in global markets requires skilled labour force in the form of IT specialist. The analysis will be split into two parts because the management of web portals can be done in-house or outsourced. The statistical evaluation will be based on the contingency table analysis and detailed summary statistics. Foreign language web portals are essential to world market opportunities. Czech labour market provides only a limited number of IT specialist to hire. Results suggest that there are differences between industries (services, trade, manufacturing) in the management of web portals (in-house vs. outsourcing) and the number of IT specialist depends on the use of foreign language web portals. The outsourcing of international management of web portals or joining the global value chains is starting to be a more affordable and interesting option because the labour costs of IT specialist are raising in the Czech labour market.

## 1 Introduction

E-commerce is one of the most successful global tools for multinational enterprises. Global market opportunities are more likely with websites that allow users from around the world to interact with the enterprise, community of consumers, and buy goods and services. Current e-business models include also electronic marketplaces with multilanguage web support and content. This content can be translated automatically or tailored to a specific

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language, which can be recognized using current user location or operating system language settings.

The goal of this paper is to analyse the impact of language support in e-commerce activities of the Czech enterprises on their performance. We tested the impact of foreign language websites on the number of orders and the number of sales. This paper is also aimed at the issue of IT workers. This paper explores the advantage of business models, which are based on in-house web development vs. the models based on external web development.

The current academic debate features the e-commerce development and critical success factors of e-commerce implementation. This paper is a case study of the Czech economy and other factors than multilanguage support and experience were explored. Fedorko et al. [5] focus on the impact of selected e-commerce elements in Czechia and Poland. They analyse ratings of e-commerce subjects (e.g. delivery time, communication, etc.). They conclude that e-commerce management should focus on building the trust of customers (certifications) and on shipping time.

Also focusing on Czech e-commerce websites, Chromy et al. [1] analysed the current situation on the market to provide innovations for models of professional communication. They assess the quality of the services and conclude that professional information provided by the e-shops varies depending on the business branch. Analysing the data of Czech IT job postings shows that such postings require a high level of education and provide an above-average payment [8], [15].

Still focusing on the Czech labour market, information-processing skills are not as fundamental, whereas education is a crucial factor of an individual's position on the labour market [9]. Novák et al. [13] points out that public institutions are crucial for the Czech labour market and recommend improving the institutional infrastructure of tertiary education to increase the efficiency of employment policies. Paliskova's [14] study is aimed at the readiness of human resources within the ICT Czech digitization process. The author points out that there needs to be a sufficient number of experts providing ICT services to the public. She also stresses the need for public computer literacy.

Social media and analyses of new generations of customers are also determinants of successful e-business models. Eger et al. [3] analyse employer branding on social media and recruitment websites. The study shows that potential employees do not regard the websites of employers as important. Micik and Micudova [12] also focus on employer branding and on how to approach the generation Y. They point out that enterprises must communicate online to successfully approach generation Y employees. Elexa et al. [4] research crowdfunding campaigns in Slovakia and Czechia. Their results show that despite not providing enough information about their core ideas, many projects are still successful. Foreign research focuses e.g. on global labour markets for IT services. Kanat et al. [7] discuss systematic advantages of the online labour markets (OLMs) for IT service providers and stress that reputation is a crucial factor for the survival of the enterprises on these markets. Another study [10] discusses the effects of global labour market trends on professional training in IT. They point out that IT managers must focus on current workforce trends and that universities training IT managers should also reflect these trends. Mammadova et al. [11] also focus on the IT market and propose a micro-level method of supply and demand for IT labour market management. Concerning the topic of regional development, Ignatov [6] points out that supporting EU prerogative must be supported since it is able to reduce discrepancies and can improve regional business opportunities.

## 2 Data and method

Data about ICT activities of enterprises in 2015 comes from the Czech Statistical Office official survey. The questionnaire contains all kind of questions regarding the use of ICT [2]. On average, around 16 % of the enterprises lack a web portal. Only 45 % of enterprises have English as a language option in their web portals. External web development and support are prevalent (more than 60 %). The variation coefficients of all variables in Table 1 are quite high and we used robust standard errors to control for heteroscedasticity in the estimation procedure.

**Table 1.** Summary statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Share of E-orders to total orders	6379	26.69	34.441	0	100
Share of Web sales to total sales	6379	7.42	19.789	0	100
IT specialists	6379	6.27	59.47	0	3600
Czech language	6379	0.84	0.370	0	1
English language	6379	0.45	0.497	0	1
German language	6379	0.24	0.425	0	1
Russian language	6379	0.10	0.301	0	1
French language	6379	0.05	0.210	0	1
Spanish language	6379	0.04	0.190	0	1
Italian language	6379	0.03	0.171	0	1
Other languages	6379	0.10	0.301	0	1
In-house Web development	6379	0.17	0.374	0	1
External Web development	6379	0.67	0.471	0	1
Without Web development	6379	0.15	0.359	0	1
In-house Web support	6379	0.24	0.425	0	1
External Web support	6379	0.60	0.490	0	1
Without Web support	6379	0.15	0.360	0	1

There is a mild selection bias. The representativeness of the size classes (Table 2) and industry branches (Table 3) is satisfactory. Most of the observations (56 %) are from smaller enterprises with 10 to 49 employees. There are 6379 observations about Czech enterprises. Most of the enterprises are from manufacturing, trade and information services. Other branches are described using NACE classification (The Statistical Classification of Economic Activities in the European Community).

**Table 2.** Size classes of enterprises

Size	Freq.	Percent
10-49 employees	3,587	56.2 %

50 to 249 employees	1,372	21.5 %
More than 250 employees	1,420	22.3 %

We used classical linear model, ordinary least square procedure, to estimate the average effects of dependent variables (language variables, IT workers variables) and some other control variables (size and industry) on the performance of the enterprise. The performance is the independent variable and we used three indicators: Share of e-orders to total orders and share of web sales to total sales.

We transformed the variables representing IT specialists and used asymptotic inverse hyperbolic sine function. Other variables are binary and untransformed. We use this function instead of natural logarithm function because the number of specialists was zero in some of the enterprises. After the estimation, we tested the stability of models. The Ramsey reset test served as a post-estimation procedure to evaluate whether the model is well specified (omitted variables, wrong functional form, etc.) or not. The baseline company for interpretation of the average effect is a manufacturing enterprise, with Czech or none web portal, with 10-49 employees, with no support and web development. The interpretation is made at 5 % level alpha.

**Table 3.** Industry branches

Industry	Freq.	Percent	Cum.
C (Manufacturing)	2451	38.43	38.42
D+E (Utility Supply)	215	3.37	41.79
F (Construction)	276	4.33	46.12
G (Trade)	978	15.33	61.45
H (Transportation and Storage)	368	5.77	67.22
I (Accommodation and Food)	482	7.55	74.78
J (Information Services)	619	9.71	84.48
L (Real Estate Activities)	199	3.12	87.6
M (Professional Activities)	306	4.8	92.4
N (Administrative Activities)	485	7.6	100

### 3 Results

**Table 4.** Performance analysis of companies – languages and the number of IT specialists

	(1a)	(1b)	(2)
	e-orders to total orders	e-orders to total orders	Web sales to total sales
IT specialists	0.039**		0.011
	(0.02)		(0.01)
IT specialists (Squared)	-9.48e-06**		-4.89e-06
	(0.00)		(0.00)

Joint F-test for IT specialists	9.62***		5.34***
IT specialists (asinh)		4.258***	
		(0.52)	
50 to 249 employees	4.028***	1.984*	-3.265***
	(1.10)	(1.11)	(0.63)
More than 250 employees	7.799***	2.395*	-4.976***
	(1.23)	(1.42)	(0.63)
In-house Web development	10.240***	8.866***	6.006***
	(2.54)	(2.54)	(1.25)
External Web development	4.387*	4.320*	3.101***
	(2.28)	(2.28)	(1.06)
In-house Web support	6.530***	4.812**	3.789***
	(2.45)	(2.45)	(1.17)
External Web support	4.398*	4.412*	2.835***
	(2.30)	(2.29)	(1.09)
English language	3.253***	1.939*	1.390**
	(1.10)	(1.11)	(0.65)
German language	-0.498	0.473	2.536***
	(1.27)	(1.28)	(0.74)
Russian language	-3.339**	-3.586**	-0.268
	(1.65)	(1.66)	(0.98)
French language	6.528**	6.873**	-0.997
	(3.01)	(3.02)	(1.85)
Spanish language	-5.397*	-6.405**	-2.676
	(3.16)	(3.15)	(1.66)
Italian language	6.719*	7.236*	4.078*
	(3.70)	(3.70)	(2.34)
Other languages	1.083	0.249	6.601***
	(1.67)	(1.66)	(1.23)
Constant	9.889***	9.882***	-1.514***
	(0.99)	(0.99)	(0.40)
Observations	6379	6379	6379
Ramsey RESET test	Rejected	Not rejected	Rejected
Adjusted $R^2$	0.120	0.131	0.104

Global market opportunities are possible if there is a way to attract customers from around the world. In general, foreign language websites analysis provided interesting and expected results. Only one model (1b, Table 4) gives efficient estimates. The other model lacks more variables and suffers from a wrong functional form (continuous variables for company capital and other usual production function variables which are not available in the dataset).

Let us interpret the potentially biased Model 2 in Table 4. There is a nonlinear relationship between company performance and the number of IT specialist. The Web sales ratio depends positively on IT specialist up to a point. There are decreasing returns to scale (global extreme at 1130 specialists, a negative effect at 2249 specialists). More efficient are

smaller enterprises. The higher shares of web sales are in the trade, accommodation, information and administrative services (Table 5). The business model that features in-house web portal development is more efficient than external development. English, German and other languages contributed to higher web sales. The estimated coefficients are biased to some extent that is why we cannot interpret the size of the effect.

The Model 1b featuring the share of e-orders to total orders is more efficient and we did not reject the null hypotheses of the Ramsey test (model has no omitted variables). The relationship between an IT specialist and e-orders ratio is non-linear but positive. The ratio will grow (0.41 %) if the number of IT specialist is 10 % higher. At 5 %, significance level there is no relationship between the number of employees and the e-orders ratio.

**Table 5.** Performance analysis of companies – control variables

	(1a)	(1b)	(2)
	e-orders to total orders	e-orders to total orders	Web sales to total sales
D+E (Utility Supply)	-4.270**	-4.508**	-1.287*
	(2.05)	(2.07)	(0.69)
F (Construction)	-5.367***	-4.909***	-0.863
	(1.76)	(1.77)	(0.85)
G (Trade)	14.390***	14.111***	11.440***
	(1.38)	(1.37)	(0.93)
H (Transportation and Storage)	-6.514***	-6.257***	0.759
	(1.50)	(1.51)	(0.81)
I (Accommodation and Food)	-2.506*	-1.715	6.779***
	(1.36)	(1.36)	(0.99)
J (Information Services)	22.878***	15.889***	5.317***
	(1.86)	(2.01)	(1.10)
L (Real Estate Activities)	-2.830	-2.796	-0.904
	(2.12)	(2.10)	(0.98)
M (Professional Activities)	4.885**	4.254**	-2.104***
	(1.97)	(1.98)	(0.78)
N (Administrative Activities)	1.347	2.520	7.382***
	(1.54)	(1.53)	(1.10)

There are significant differences between industry branches. These differences are expected because more electronic orders are in the retail markets. The higher share of the e-orders ratio is in Trade, ICT services, and Professional activities than Manufacturing (or Real Estate, and Accommodation). The lowest is in the Utility Supply, Construction, and Transportation and Storage.

Not external, but in-house web development contributes to a higher share of e-orders. The ratio is about 8.97 higher in enterprises with own web development team. The comparison is valid to the constant term which is a company with no web development, Czech language website, and from the manufacturing industry.

Surprisingly, English or German language is not contributing to the higher share of orders. At 5 %, significance level only two languages differ from Czech. Web portals with

the Russian language have on average 3.59 % lower e-order ratio than Czech only portals. Web portals with French language option have on average 6.87 % higher share of sales than Czech only portals.

## 4 Conclusion

The foreign language support in e-commerce activities of the Czech enterprises impacts their performance. We tested the impact of foreign language websites on the share of e-orders on total orders and the share of web sales to total sales. There is an advantage of business models, which are based on in-house web development vs. the models based on external web development. Web portals with French support have on an average higher share of web sales. The advantages of other languages should be tested also in financial terms or full production function to reveal more about this opportunity to enter global markets.

ICT workers and in-house web development is a substantial advantage in the Czech market. The relationship to the performance of companies is non-linear. Some of the models suggest decreasing returns to scale. In the case of e-orders ratio, the relationship is non-linear in absolute terms. In other words, to some extent, a company has to have a good and experienced team of ICT workers capable of in-house web development to enter global markets.

This paper explored ratios and some non-financial performance variables. Outsourcing is a great opportunity but this paper did not reveal its beneficial nature. Further research is needed in this area because global opportunities are also in the global value chains and e-commerce marketplace portals.

This paper was created at the Institute of Technology and Business in České Budějovice during the project „8110-006 -Inovace předmětu Základy podnikového práva v kontextu změn na trhu práce v České republice a Evropské unii“ (Innovation of the course Basics of Commercial Law in the Context of Changes in the Labor Market in the Czech Republic and the European Union).

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