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Utilization of Business Experiments in Postindustrial Environment

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ANNOTATION

Information technologies in the postindustrial era require the companies to use new tools to be competitive within the high-velocity environment. One of the new tools they can use is business experiment. Full potential of business experiments rose with the evolution of information technologies. Using sophisticated information technologies or even basic approaches can help to get decisions much faster or even immediately in real time compared to using traditional methods.

The purpose of this paper is to present several ways of how to use business experiments that can be used to enhance company's performance and to find out how prone the Slovak companies are to use business experiments. It should also give a picture how are the business experiments linked to level of informatization of the companies.

The two main research foundations of the study were studying actual trends in researches on the topic of business experiments and a self-made survey among 382 companies in Slovakia as a partial outcome of my dissertation research. To interpret the research mathematical and statistical methods were used. First the theoretical basics were formulated and interpreted, as second these basics were enhanced with survey results.

The biggest value of this paper is to present some new approaches of how to gain competitive advantage using business experiments. Using the business experiments the competitive advantage can be gained by decreasing the costs when designing the right portfolio, increasing profit by setting the optimal price or just by designing the right product fitting the specific needs of target group or finding the best business conditions like best geographical situation or even finding some correlations between not related products on the first view that allow to bulk them to increase the profit.

KEY WORDS

business experiment, postindustrial, experiment, strategy, business model, decision making, pricing indifference band

INTRODUCTION

Experiments are well known in scientific area. According to oxford dictionary experiment is *“a scientific procedure undertaken to make a discovery, test a hypothesis, or demonstrate a known fact”*.¹ Another definition of an experiment is one from The American Heritage Science Dictionary, experiment is *„a test or procedure carried out under controlled conditions to determine the validity of a hypothesis or make a discovery”*.²

For the purpose of this paper under business experiment we will understand an approach where a company tries to test a hypothesis or an assumption in a controlled procedure skipping a step of thorough research. Sometimes an unexpected outcome can be a result of a business experiment if done thoroughly and all the collected data is analysed. To skip the thorough research and do business experiment instead of it is vital for the definition of

¹ Oxford Dictionary. [cit. 2013-03-23] Dostupné na internete:
<<http://oxforddictionaries.com/definition/english/experiment>>

² The American Heritage Science Dictionary. [cit. 2013-03-23] Dostupné na internete:
<<http://dictionary.reference.com/browse/experiment>>

business experiment. When a company does a business experiment, the product or the object of testing is already on the market. The sense of it is to reduce reaction time and costs of a research and to speed up the decision-making. When using a traditional research the company uses thorough planning, sampling, testing and modelling. The dimension of control is that a company using business experiment will design the experiment in a way where it can observe the situation and collect the data it needs to come to a conclusion.

According to previous researches it seems that the probability that an approach using business experiments will be successful is more than just comparable with a traditional approach. In the work *New Business Models In Emerging Markets* Eyring/ Johnson/ Nair said that business experiments outperformed the traditional approach “*Testing and implementing the business model blueprint in emerging markets is as much as an art as a science. Having a cadre of global experts study the market for months and create a plan that is then handed over to the local team for execution simply does not work. Quick adjustments based on early lessons learned on the ground trump the best and most detailed strategic plan developed before the fact*”³.

Anderson/ Simester wrote *A Step-by-Step guide to Smart Business Experiments* where another obvious difference arises. If testing a concept using business experiment you do not change only one variable as in a scientific experiment, in business experiment you change all the variables needed to get the final concept that you believe is the best and then you test it. They wrote “*In academic experiments, researchers change one variable at a time so that they know what causes the outcome. In business setting, it is important to first establish proof of concept. Change as many variables in whatever combination you believe is most likely to get the results you want.*”⁴

If looking at the costs and time factors a good comparison is offered by Baker/ Marn/ Zawada in their work *Price Smarter on the Net* where they use a sort of business experiment on the internet to determine the precise price within pricing indifference band. “*All products have a pricing indifference band, a range of possible prices within which price changes have little or no impact on customers purchase decisions.[...] Determining the borders of these indifference bands in the physical world is difficult, expensive, and time-consuming. Traditional price-sensitivity research can cost to \$300.000 for each product category and take anywhere from six to ten weeks to complete. [...] On the internet, however, prices can be tested continually, in real-time, and customers’ responses can be instantly received.*”⁵

So as we see there are multiple potential benefits for a company to use business experiments instead of traditional approach. If done correctly the result of traditional and experimental approach should be the same but the business experiment can deliver results faster and with lower costs. This is why it can become necessary in dynamic environment. However there is also a downside of it. The potential failure of an essential experiment for example with a result, that a product is not suitable for a country can bring up high costs of this experiment. The contra argument is that the costs of this failure must not be much higher than the costs of a regular research and if a company stays by this experimental approach in long term the sum of benefits will outweigh a temporal failure.

³ EYRING, M.J. – JOHNSON, M.W. – Nair, H. *New Business Models in Emerging Markets*. In *Harvard Business Review*. ISSN 0017-8012, January – February 2011, s.88-95.

⁴ ANDERSON, E.T. – SIMESTER, D. *Smart Business Experiments*. In *Harvard Business Review*. ISSN 0017-8012, March 2011, s.98-105.

⁵ BAKER, W. – MARN, M – ZAWADA, C. *Price Smarter on the Net*. In *Harvard Business Review*. ISSN 0017-8012, February 2001, s. 1-7. Reprint R0102J.

AIM AND METHODOLOGY

The aim of this paper is to present several ways of how to use business experiments that can be used to enhance company's performance and to find out how prone the Slovak companies are to use business experiments. The main question for the research was how the business environment in Slovakia was ready for business experiments. It should also give a picture how are the business experiments linked to level of informatization of the companies.

In the theoretical part of this paper main method used was paper study and its interpretation. Not a lot of papers were written on this topic so the cross topic research was made where I was looking for the papers about decision taking where the companies used methods that met the requirements of business experiments mentioned in the introduction.

The second part of this paper is an output from a self-made research. The research was done on a sample of 382 companies in Slovakia. Those companies were from across all the spectrum of industries. The research tool was a survey containing both open and closed questions about the company, environment, information technologies and strategy. Main design of this survey was directed at my dissertation paper on the topic of Business Strategies in Postindustrial Era, but a portion of questions was dedicated to business experiments. The survey was done in fall 2011. The survey was processed in a spreadsheet. The data processing process was defined mainly by statistical summarization, data scoring, scoring evaluation and correlation analysis.

The pronation to business experiments indicator is a synthetic indicator containing four individual ones. It contains of trial-error usage, product calibration on the go, internet activity analysis, internet survey. All this factors were identified in theory an important part of business experiments. The indicator is an addition of these four factors. The higher the result, the bigger the more is the environment proper to use business experiments.

The correlation was used to quantify relation between informatization, information technologies and trial and error approach and product completeness. It shows how one factor reacts on a change of another one.

Figure 1: Formula for Pronation to Business Experiments indicator

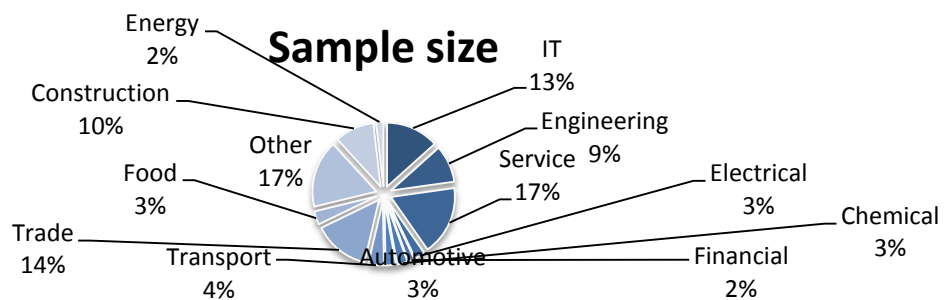
Pronation to Business Experiments (PBE) = $x_1 + x_2 + x_3 + x_4$, $PBE \in \langle 0; 11 \rangle$, where

- x_1 - product calibration on the go ($x_1 \in \{3; 0\}$)
- x_2 - customer's internet activity analysis ($x_2 \in \{2; 0\}$)
- x_3 - usage of the internet as a survey medium ($x_3 \in \{2; 0\}$)
- x_4 - trial and error approach usage ($x_4 \in \{4; 0\}$)

(the bigger was the influence on business experiments, the bigger was the value of the indicator)

Source: Own processing

Figure 2: Distribution of industries in the survey



Source: Own processing

RESULTS

A business experiment is an alternative to traditional approach of thorough research. The main difference is that using a business experiment you go with the product on the market, collect data and test your presumption. It is very important to not get confused and to misinterpret launching product “on a wing and a prayer” for a business experiment. Business experiment has controlled environment and starts in a small scale.

A basic typology will divide business experiments in two basic types based on the character of the object of the experiment. There will be an essential business experiment where a product is tested whether it is viable or not or determining the right configuration of essential properties of the product like what problem will it solve. Another type of business experiment will be a configurative business experiment. Configurative business experiment does not test the fundament or essence of the product. It tests its settings like price or place.

Another typology will be based on the object of the business experiment itself. It can be business experiment on price looking for the right price on the pricing indifference band. Or the place like a company looking for the best place for a store. It can also be the product properties, company’s promotion, business model testing or customers segmentation.

In an article Don’t guess, experiment⁶ Weitzman wrote Levitt/List see two types of experiments. They distinguish between accidental and deliberate experiments. Accidental experiments use data collected automatically. Deliberate experiments use data collected by a constructed approach. On behalf of business experiments they say that the lessons are enormous and the costs often trivial, accidental experiments are even free. The economic models are often simplified and the complex world needs more reality related data.

Information technologies are an influential factor to business experiments because in many cases only they make it possible to do a business experiment and in many cases they make it much easier and effective to do so. Information technologies keep the costs of an experiment low because the variable costs are very low once an automatic program is developed. Also the time of response is kept short because the feedback is almost immediate, in real-time. The experiment is more precise. Using information technologies it is possible to target a narrow group. The precision is also provided by the enormous quantum of data that can be collected due to information technologies.

How to do a Business Experiment

There are several possibilities how to design business experiment. One of them was developed by Anderson/ Simester and published in the paper A Step-by-Step guide to Smart Business Experiments⁷. In their work they suggest that a company should follow 7 rules when practicing a business experiment. They should focus on individuals and think short term. Keep it simple. Start with a proof-of-concept test. When the results come in, slice the data. Try out-of-the-box thinking. Measure everything that matters. Look for natural experiments. Very important part of a business experiment is to have a testing and a control group and to choose the right feedback mechanism where a behavioral is more valid then perceptual. In behavioral feedback mechanism we observe people’s behaviour and in perceptual their perceptions that can differ to real behaviour.

⁶ WEITZMAN, H. Don’t guess, experiment In FINANCIAL TIMES [online]. 19/4 2009 [cit. 2013-20-02]. Dostupné na internete: < <http://www.ft.com/intl/cms/s/2/4a552586-2b63-11de-b806-00144feabdc0.html>>. ISSN 0307-1766.

⁷ ANDERSON, E.T. – SIMESTER, D. Smart Business Experiments. In *Harvard Business Review*. ISSN 0017-8012, March 2011, s.98-105.

Another approach to business experiment design was developed by Davenport, who in his paper *How to Design Smart Business Experiments*⁸ outlined a procedure. A company should create or refine hypothesis that could generate substantial economic value. Design test that contains sufficient test and control sites while using simulations to explore strategies for creating control groups. Execute test and discuss it thoroughly with test managers and personnel. Analyse test and ensure it is statistically significant. Plan rollout and study attributes of the test. Rollout and see the rollout as a test itself. Establish a learning library with a summary of each test accessible to employees.

Essential Experiments

Topic on essential experiments is handled by Chesbrough in the paper *Why Companies Should Have Open Business Models*⁹ where he discusses how to use experiments with the business models. In postindustrial era that is defined by information technologies arisen trends that make it hard to justify innovation investments in traditional closed business models. As product lifecycle shortens (less market revenue) and costs of innovation rise there is still less room for profit. That is why some companies changed from closed to open business model where they can integrate modules, products and innovations developed by another companies. To do so it requires the ability to experiment with their business model. One example is a so called “white box” brand. It is a brand created to experiment with and that has no obvious connection to established brands. IBM is a good example for how to change your model. They picked a module in their business model where they were losing money and tried to do the work by them self. Now it is a profitable one. So identifying a place with high costs can be ideal to rethink, to transfer and to experiment with because the potential gain is high. The open model influence the profit by shrinking the development costs thru costs and time savings, leveraging external development and gaining revenues by creating new revenues with license, spinoff and divest.

A good business experiment environment is created when a company enters a new market. It is natural that on the new market there is a new set of rules, influenced by a different economic and social situation. The more different the new market is the more probable is that to be successful on such new market new business model needs to be created. To meet the unmet needs of the new market, business experiments seem to be an ideal way how to do it. One of the reasons is the high uncertainty level that makes a traditional research less effective. As mentioned in the introduction due to research of Eyring/Johnson/Nair the traditional approach with experts studying and planning was outperformed by experimental approach. An example is a Vodafones M-PESA (mobile money) operated by Safaricom in Kenya. It was launched to solve problem of transferring money in not so developed countries. Using this new model to meet the customer’s needs it used Kenya for an experiment and now wants to expand this service to other countries with similar difficulties with money transfers that are expensive and time demanding.

In a paper *Amazon.com: The Brink of Bankruptcy*¹⁰ Applegate wrote that Amazon experimented with its business model when they added new stores to their core business like toys, home, electronics. After this experiment failed they closed their online toy store and partner with Toys’R’Us. Using its technology Amazon then hosted the Toys’R’Us online

⁸ DAVENPORT, T.H. *How to Design Smart Business Experiments*. In *Harvard Business Review*. ISSN 0017-8012, February 2009, s.1-8. Reprint R0902E.

⁹ CHESBROUGH, H.W. *Why Companies Should Have Open Business Models*. In *MIT Sloan Management Review*. ISSN 15329194, Winter 2007, vol.48 no.2, s.21-28. Reprint 48208.

¹⁰ APPLGATE, L.M. *Amazon.com: The Brink of Bankruptcy*. In *Harvard Business School*. May 2010, s.1-11. R.n. 9-809-014.

store with also the managerial and logistical activities to create a new business model as a distributor.

Configurative Experiments

Thanks to information technologies configurative experiments can be utilized very easily. In configurative experiments company tries to maximize efficiency of a product by looking for the right configuration. The most sense makes to experiment with marketing mix. For example a Subway chain was considering dropping a price of a sandwich on 5 USD. The management had fear that this could relocate the demand from more expensive sandwiches. Using an experiment they come to a conclusion that such configuration would pay off.

Another typical configurative type of business experiment would be the pricing indifference band experiment. This type of experiment is strongly tied to information technologies. The typical test would let a company offer to every 50th visitor a higher price for a product and then compare the purchase rates. Sometimes a regional differentiation may be preferable because in history it happened that the companies alienated their customers that became aware of the fact that they paid higher price than others.

The importance of thorough analysis of data collected by an experiment can be demonstrated on the next example. A company sent to their customers two types of catalogues. One type of catalogues contained shallow discounts and the other one deep discounts. The amount of money spent was nearly the same, so it was more profitable not to use deep discounts. After thorough analysis more interesting was the fact that customers who recently bought a high-priced item before receiving the catalogue spent significantly less money if they got the catalogue with deep discounts than those who got the shallow discounts catalogue. After this experiment the company established direct-mail system to avoid this unfortunate situation.

Information Technologies and Business Experiments

In *Big Data: The Management Revolution*¹¹ McAfee/Brynjolfsson wrote that using information Technologies to collect data, the enormous quantity of them can provide precise information and lead to better decisions. According to their study data-driven companies were on average 5% more productive and 6% more profitable. So how to use big data? Company should pick a testing unit with a team of data scientists. Identify 5 opportunities based on big data. Start innovation process of experimentation, measurement, sharing and replication. Share some data with the outside world to take advantage of potential external idea benefits.

Barton/ Court wrote in *Making Advanced Analytics Work For You*¹² about how to benefit from big data and to improve company's performance. They say that there are three rules to follow. Company should have multiple sources of data both external and internal. Their prediction and optimization models should focus on the biggest drivers of performance. Transform the organization and teach the employees to use the tools, that should be simple and user friendly.

How much information technologies influence business can be seen in an example from *Price Smarter on Net* by Baker/ Barn/ Zawada where they state that *"prices for hot products are 17% to 45% higher online than off because the web increases the chances of finding a buyer willing to pay a higher price"*¹³. They also see three main benefits for a company using the internet. It is precision, adaptability and segmentation. The company can set more precise the

¹¹ MCAFEE, A. – BRYNJOLFSSON, E. *Big Data: The Management Revolution*. In *Harvard Business Review*. ISSN 0017-8012, October 2012, s.1-9. Reprint R1210C.

¹² BARTON, D. – COURT, D. *Making Advanced Analytics Work For You*. In *Harvard Business Review*. ISSN 0017-8012, October 2012, s.1-7. Reprint R1210E.

¹³ BAKER, W. – MARN, M – ZAWADA, C. *Price Smarter on the Net*. In *Harvard Business Review*. ISSN 0017-8012, February 2001, s. 1-7. Reprint R0102J.

optimal price (approximately after 200 transactions). It can adapt to a changing environment more quickly with a speedy price change. Information technologies make it possible to segment the customers more creatively, accurately by setting precise segmentation dimensions and barriers.

Business Experiments in Slovakia

In Slovakia there are a lot of companies using at least partially business experiments as a tool for their business decisions. In following text the results of self-made research are presented to show the overall conditions in respect to business experiments.

Typical company in the research is a small company with a turnover up to 10 mil EUR p.a. and up to 50 employees. Average rentability of costs is 18.13% with a median value of 10.135%. In the last 3 years turnover rose with a tempo that not exceeded 2.15 % p.a. and the price of a main product also rose with a tempo slower than 2.15% p.a.

Of the companies 14.2% (54/381) observed important changes more than once a year. 37.5% (143/381) companies experienced important changes once a year. 48.3% (184/381) companies experienced important changes once in three years. This means that more than a half of the companies are in a strongly dynamic environment and 14.2% of them in an almost always changing instable environment. The more instable the environment is the more attention should be put on the utilization of business experiments because they can help a company to adapt more quickly to a changing environment compared to a thorough research.

32.2% (118/366) companies invest yearly (0-1% of their turnover in innovation. 29.8% (109/366) invest (1-3% of their turnover into innovation. 24.3% (89/366) invest (3-10% and 13.7% (50/366) invest more than 10 % of their turnover into innovation. The more a company invest into innovation the more opportunities it has to use business experiments. In previous text was mentioned the importance of business experiments in open business model frequent innovations.

34.2% (113/330) of the sample enter the market with a product as fast as possible and configure its attributes on the run. 65.8% (217/330) companies enter the market only after the product is fully ready. If a company need to enter the market as fast as possible it should consider business experiments because they bring results quickly and efficiently.

Important changes have a character of incremental change in 74.9% (278/371) of cases. In 25.1% (93/371) they have a character of a sudden change. Sudden change needs an immediate adaptation. Using information technologies, monitoring the market and the environment and to use business experiment can help to recognize and adapt to such a change.

75.9% (290/382) uses the full potential of information technologies as they use it for communication, internal and external management. That means that probably there is already an infrastructure in place that suits business experiments.

Due to information technologies the product changed in 33.2% (127/382) cases. If information technologies had such an impact on the product it is possible that just a small adjustment can prepare a perfect environment for business experiments.

28.5% (109/382) companies realize their income from information technologies. 30.4% (116/382) realize a little share of their income from information technologies and 41.1% (157/382) do not realize any income from information technologies.

38.5% (147/382) of the companies use analytical tools to analyse internet activities of their customers. This is vital to use analytical tools when using business experiments.

60.2% (230/382) use internet as a medium for surveys. Survey is a feedback tool in business experiments. Mostly it is a perceptual kind of feedback mechanism tool.

68.4% (257/376) companies in the sample do not segment their customers. 23.7% (89/376) uses broad segmentation. 3.7% (14/376) use narrow segmentation. 4.2% (16/376) have

individual segmentation. Information technologies allow doing more precise segmentation that leads to more precise experiment outcomes.

26.1% (99/380) of companies consider themselves as leaders in the industry, 21.1% (80/380) are following the leader, 46.6% (177/380) are following the market trends, 6.3% (24/380) feel that they have an indifferent position against competitors.

50.3% (192/382) companies have a rigid type of strategy with opportunities of correction. 28.8% (110/382) use floating goals with dynamic adaptation. 20.1% (80/382) use simple rules with a freedom of decisions. More open and liberal types of strategy are more suitable for business experiments because business experiments needs the flexibility to make quick decisions and course changes.

55.1% (184/334) achieve their competitive advantage thru operational effectiveness, 44.9% (150/334) achieve their competitive advantage thru strategic positioning.

The decisions process has in 78.9% (247/313) form of thorough research and in 21.1% (66/313) form of trial and error. The group of trial and error is composed of business experiment friendly companies.

5.2% (20/383) companies in the sample do not customize the product, 11.2% (43/383) do only small product modifications, 19.8% (76/383) are willing to do modifications that do not change the character of the product, 25.3% (97/383) companies do partial character modifications, and 38.4% (147/383) companies in the sample are willing to do a full customization to meet the individual customer's needs. The more is a company willing to customize its product the more efficient can a business experiment be, because more variation can be tested.

Typical strategy in the sample is in 41.8% (152/364) building a strong image, in 26.1% (95/364) searching for opportunities, in 18.4% (67/364) product differentiation and in 13.7% (50/364) narrow specialization. Searching for opportunities and product differentiation appears to be strategies that make a good soil for business experiments because the character of business experiments leads to product differentiation thanks to searching for opportunities.

The pronation to business experiments is studying how strong the environment is appropriate to use business experiments. The indicator consists of four factors, trial-error usage, product calibration on the go, internet activity analysis, internet survey. The indicator can have values from interval $\langle 0;11 \rangle$. There were 270 companies in the sample suitable for this indicator. The average value was 6,51, what corresponds with 59,18 % of maximal intensity. Median was 6.

The sector with the highest number of companies with pronation to business experiments higher then 7 (63,6 %) was IT sector with 31 such companies. Second was service with 25 and third trade with 19. The lowest numbers of companies with high intense prone to business experiments ware in health (0), automotive (1) and food (1) sector.

Sectors with the highest average and relevant sample size, so withe the best conditions to use business experiments were IT (7,81), trade (7), finance (6,73) and service (6,72). The least suitable sector were automotive (5), health (5,14), food (5,44) and construction (5,75).

Table 1: Pronation to business experiments

Sector	Sample size	Intensity > 7	intensity > 7 in %	Average intensity <0;11>	Sector	Sample size	intensity> 7	intensity > 7 in %	Average intensity <0;11>
IT	43	31	72,1	7.81	Chemical	9	3	33,3	6.33
Service	43	25	58,1	6.72	Automotive	9	1	11,1	5
Trade	30	19	63,3	7.00	Energetics	5	2	40,0	6.4
Construction	24	6	25,0	5.75	Transport	10	3	30,0	5.9
Engeneering	25	9	36,0	5.96	Food	9	1	11,1	5.44
Electrotech.	10	5	50,0	6.40	Health	7	0	0	5.14
Finance	11	8	72,7	6.73	Agriculture	1	1	100	7
Woodwork.	3	2	66,7	6.33	Other	31	11	35,5	6.06

Source: Own processing

DISCUSSION

Health, food and automotive sectors are characteristic of safety norms and conservatively perceived safety properties. This can partially obstruct the business experiments. Especially the health and automotive sectors are strongly influenced by high costs of research so the experiments can have a bad image. Flexible businesses with intense usage of IT like IT sector, service, trade and financial sector create ideal environment for business experiments as they have both technical equipment for experiments and a business that can be modified without significant expenses.

The presumption also tested was that more intense usage of information technologies should lead to more intense usage of business experiments. To test this presumption three correlations were analysed. The correlation between informatization and trial and error approach (-0.128), between the level of information technologies usage and trial and error approach (-0.178) and between the level of information technologies usage and completeness of a product by its launching (0.02), but no significant correlation was found. One explanation could be that however information technologies are beneficial to business experiments they are also necessary for running business indifferent to the attitude to business experiments. Nevertheless information technologies are beneficial to business experiments they are not indispensable so there can be companies using business experiments but not the high level of information technologies. The presumption was tested on the whole group across all industries so there can be a difference if concentrating on a specific sector. This is also the suggestion for further analysis.

CONCLUSION

As shown business experiments can be a difference maker between successful company and not so successful one. Information technologies brought a tool that improved the business experiments to more efficient level. A business experiment differs to a traditional research with that it is launched on the market in controlled environment and in a moderate scale. It is important to have a test group and a control group and to collect and analyse as much data as possible. Experiments can be accidental or deliberate, and essential or configurative. In Slovakia business experiments are quite common. A significant share of companies in

Slovakia has at least good conditions to use them. No meaningful relationship was identified between intensity of usage of information technologies and business experiments.

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