

# Maturity Level of Cluster Based on Financial and Non-financial Variables (Case of Slovak Technological Cluster)

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## Abstract

*Technological cluster in context of Slovakia is mostly association of different types of bodies representing public and private sector. Aim of such an organization is based on bottom-up approach to connect key players in the geographical area and/or industrial sector. With non-for-profit and non-governmental orientation of clusters they are deeply dependent on active participation of involved parties and sources of financing for the activities and management of cluster.*

*Aim of the paper is to show on example of real technological cluster from Slovakia how active participation of members and financing are fundamental for cluster existence, grow and sustainability.*

*Based on the data from real cluster, such as number of members/active members, activities, financial sources (number of them, type and value) over period of time, maturity of cluster can be concluded. Active participation and financial model is changing as cluster goes more mature from low level of involvement of members to higher and from one source financial model to multi-source financing.*

**Key words:** cluster, evaluation, maturity, development

## 1 Introduction

Today, cluster initiatives are a central part of industrial, regional and innovation policy-making across developed world (Solvell, Lindquist and Ketels, 2003). The concept of clusters has emerged as a central idea in competitiveness and economic development over the last decade (Solvell, Lindquist and Ketels 2003) as in 2007 were clusters described. Looking at 2007 as a year when Kosice IT Valley was established, as one of the first clusters in Slovakia, there is a time gap between first clustering activities worldwide and in Slovakia. In 2009, several technological and hospitality clusters been operating in Slovakia (see Balog and Duman, 2010) but only in 2012 clusters were for the first time officially mentioned in central government material as beneficiary for financial support scheme published by Ministry of Education, Research, Development and Sport. This clearly illustrates some facts:

- time-gap between development and maturity of clusters in Slovakia compare to Europe/worldwide,
- in Slovakia, clusters are bottom-up approach based,
- clusters are depended on their members' support and their own activities and
- clusters have to be active in order to make members more active and involved due to the fact they depend on them.

In 2009, Slovak clusters were mapped for the first time on the national level (Balog and Duman, 2010). On the other hand, as part of the European Union (EU) efforts to create more world-class clusters across the EU by strengthening cluster excellence, the Commission

launched in 2009, under the Competitiveness and Innovation Programme, the European Cluster Excellence Initiative (ECEI). Also, the European Secretariat for Cluster Analysis was established to offer practical advice to cluster management organizations<sup>1</sup>. The external assessment body on European level start actively benchmark and/or audit clusters' maturity.

## 2 Kosice IT Valley

Kosice IT Valley is nowadays recognised as one of the strongest and oldest cluster in Slovakia. First talks about common needs in the field of ICT education and possibility to create a activity/project to help fulfil discussed needs of growing ICT industry in the region of Eastern Slovakia took place in 2006 in Kosice. Later that year, idea of Kosice IT Valley was born. Official establishment took place in April of 2007. The aim has been to create suitable conditions for the creation and development of ICT center of excellence in the territory of Eastern Slovakia and make socio-economic environment in the region attractive especially for young people and also to contribute to building of information and knowledge society in the region and create a communication platform between public administration, business and educational institutions, leading to acceleration of the ICT industry development in the region (Annual Report, 2007). As seen in literature (e.g. Sokol, 2013) aims of Kosice IT Valley is to create a Silicon Valley in Eastern Slovakia.

Company can shape educational institutions in many ways (Porter, 1998). Main scope of IT Valley has been support of education – connect education and business, customize curricula, introduce new subjects or update existing ones. Over the years focus on education stays as one of the priorities but scope of the cluster itself has gone beyond. Naturally, innovations, research and development and support of investments become an integral part of the cluster, together with acting as a good practise ambassador and strong networker. Cluster has developed itself over the years, it has became mature on a certain level. In following sections, set of variables are presented to demonstrate process of development in cluster over the time, the way cluster go matured.

From the organisational point of view, Kosice IT Valley is legal body in a form of association of legal entities. Therefore, cluster do not have obligation to submit annual reports and report most of the changes inside the organisation, e.g. changes in supervisory board, as most of the non-for profit type of bodies have to do. Official duty of reporting is very important regarding availability of public data. There are 4 bodies within the cluster which can influence operation of the cluster – executive director, board of directors, general assembly and supervisory board.<sup>2</sup>

2 types of membership are available – member and supporter. Main difference is that member do have a possibility to vote as a part of general assembly and can nominate candidates to all bodies of the cluster. Up to 2014 membership fee model was very easy and strict. First level criterion was type of membership and second level criterion was type of member – company, university/school, governmental organisation or student organisation. After pressure, mainly from the side of companies, in 2014 there has be a change in that model. Third level of criteria has been introduced for the company members, number of employees. For supporter type of membership second and third level of criteria for membership fee is not relevant

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<sup>1</sup>Based on information from <http://www.cluster-analysis.org/>

<sup>2</sup>Based on the Statute of Kosice IT Valley

anymore. Also new type of member has been introduced – start-up (new company up to 3 years of existence). Amount of membership fee also decreased compare to previous model.

### 3 Methodology of Assessment

For purpose of this paper, technological cluster will be assessed. Set of financial and non-financial variables were chosen to demonstrate level of development of Kosice IT Valley, as an example of technological cluster in Slovakia. All data has been gathered from internal sources of the cluster. Therefore, some of them, especially financial, can not be published in absolute numbers. Most of the data are for whole period of cluster existence (2007 – 2013/14).

Chosen variables are as follows:

- non-financial – amount of members/active members, executive director appointments over the time-period of cluster existence and
- financial - % increase of budget, sources of financing and ratio in annual budget.

There are assumptions that can be taken up:

- financial variables are increasing over the time, at least as trend-line,
- amount of members/active members is increasing and
- number of financial sources is increasing.

We can assume, that increase in financial variables supported by increase in non-financial variables over period of time is showing positive trend in cluster development e.g. cluster is maturing.

Level of maturity can be compared to various scales and different approaches and systems can be considered. Decision about usage of chosen approach has been made based on following facts:

- existing approaches and systems,
- own experience of cluster with such an assessment and
- characteristics of cluster – mainly geographical location and scope.

Due to the following facts, we have decided to use scale of European Cluster Excellence Initiative (ECEI), to set up level of maturity. There are 3 levels of cluster maturity available:

- Bronze Label of Cluster Excellence, where benchmarking is used,
- Silver Label of Cluster Excellence, where quality audit is used for assessment and
- Golden Label, where quality audit is used for assessment.

Initially, there was only benchmarking level “Bronze” a quality audit for “Golden” maturity. To digest more mature clusters Silver Label has been recently introduced to distinguished more in detail development process in cluster.

According to English dictionary mature can be understood as having qualities of something that is grown or developed (Semi, 1993). Grow or development of IT Valley was confirmed by successful benchmarking for Bronze Label done in end of 2012 with certificate received beginning of 2013. Cluster management organizations are benchmarked to demonstrate their interest in striving for excellence. Analysis covers 36 indicators with regard to the structure of the cluster, the cluster management and the governance of the cluster, financing of the cluster management, services provided by the cluster management, contacts and interaction within

the cluster and achievements and recognition of the cluster.

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#### 4 Financial and Not-financial Variables for Kosice IT Valley

Based on methodology described in Section. 3, internal analysis of real data is presented for mentioned valuables in this section. All data are gathered from internal documents of the cluster. Mainly annual reports of the cluster are used as source. Valuables have been chosen to clearly show development of cluster over the time as discussed earlier. They are also matching some of the indicators of external ECEI assessment.

First information that cluster is usually sharing also publicly is number of members. As seen in Table 1, importance has to be given not only to actual number of members, but also to number of active members.

**Tab. 1 Members of Kosice IT Valley 2007-2014**

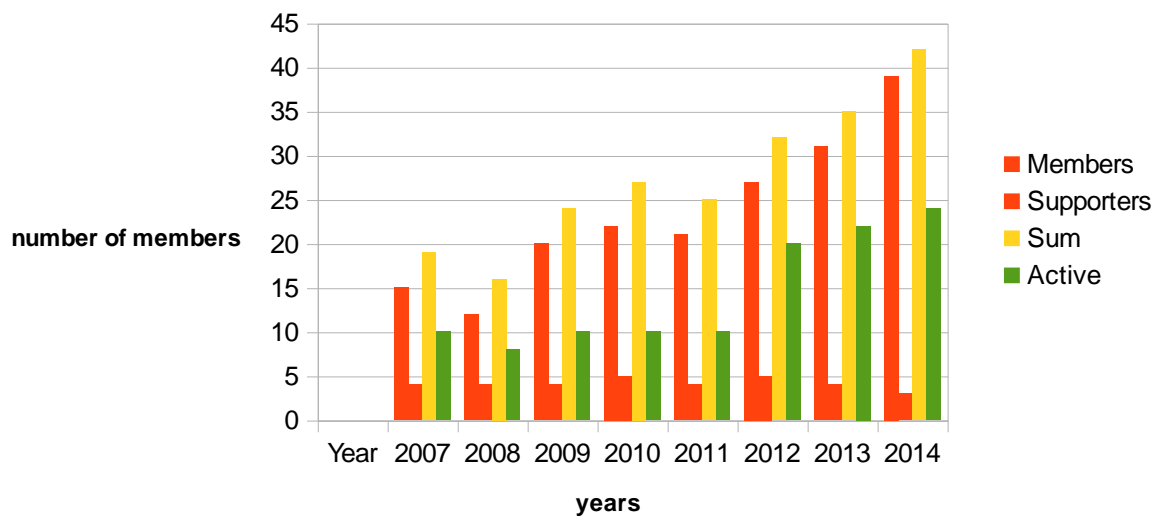
Year	Members	Supporters	Sum	Active
2007	15	4	19	10
2008	12	4	16	8
2009	20	4	24	10
2010	22	5	27	10
2011	21	4	25	10
2012	27	5	32	20
2013	31	4	35	22
2014	39	3	42	24

There were 10 founding members, but up to end of 2007 5 more members and 4 supporters join in, where 10 of them can be called active<sup>3</sup>. Positive progress can be seen in increasing number of members, but gradually also increasing number of active members. Supporters are quite stable in numbers, not raising or falling too much, as there are perceived as “not decided yet” to be or not to be a part of the cluster.

3

Member can be considered active when is involved in at least one activity of the cluster during calendar year and/or have a nominee in one in board of directors of supervisory board.

### Members of Kosice IT Valley



Graph 1 Members of Kosice IT Valley 2007-2014

When we will have a closer look on the activities of cluster, there are generally 3 periods for Kosice IT Valley:

- Period I (2007 – 2009)

Typical for Period I are exact activities with defined scope, responsible person and budget. Definition of activities was done usually beginning of year with the same year to be finished. Aim had to be in-line with vision and mission of the cluster. Changes were very rare and deeply discussed. This approach became not suitable for the cluster and discussion started how to changed it. Amount of activities is slowly increasing.

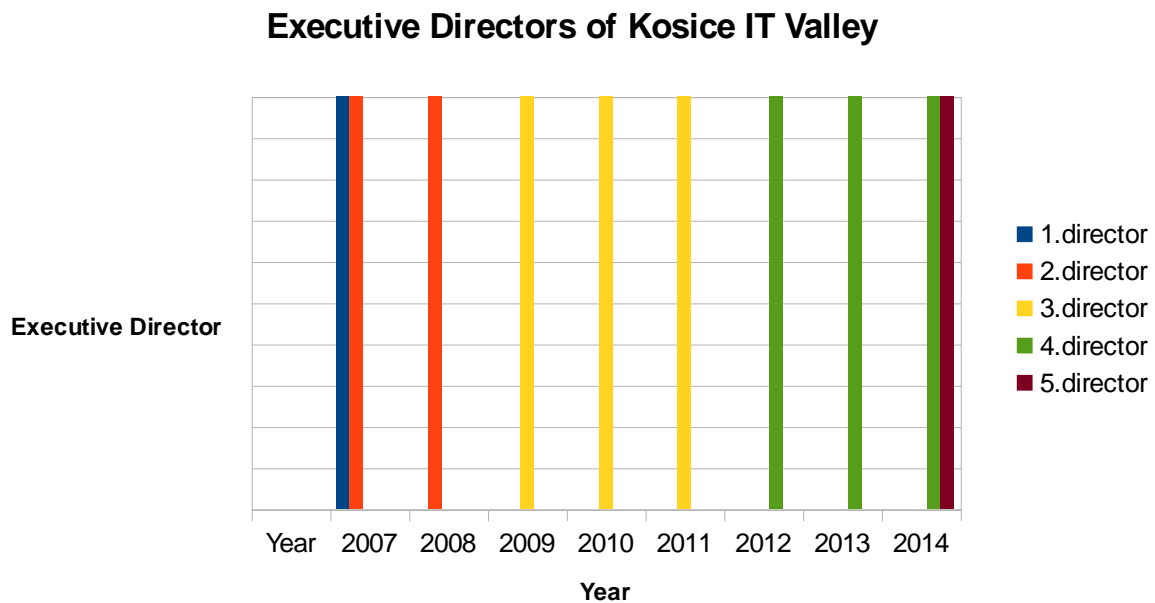
- Period II (2010 – 2013)

For the first time in 2010, there were 3 areas defined for activities – education, innovations and investments. Over Period II first working groups occur ed to propose activities, also higher involvement of individual members can be seen. Their existence and performance was fuzzy and with no external push from cluster management they naturally died out. Amount of activities increased is largely.

- Period III (started 2014 )

Period III brought new membership model and recycled some of the concepts used in past to upgrade cluster performance. 4 stable working groups are in place with stable leader, supported by budget chapter and possibility to independently obtain external funding. For-profit activities become integral part of cluster.

To more understand dynamics in number of members/active members and also activities is interesting to see how executive directors changed over the time (see Graph. 2).



**Graph 2 Executive Directors of Kosice IT Valley 2007-2014**

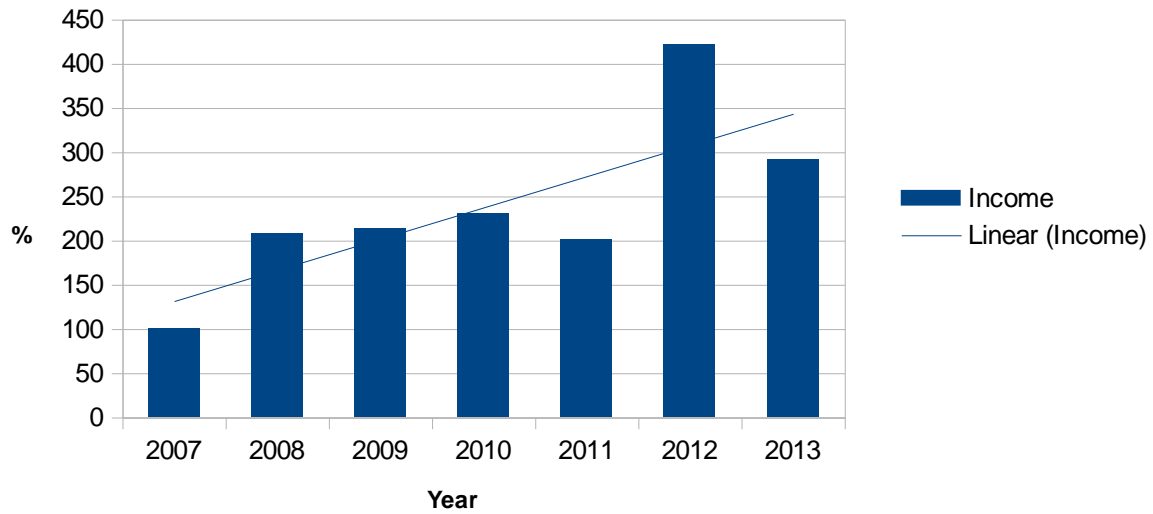
From 2007 Kosice IT Valley have had 6 directors, first appointed in late 2006 (to prepare Kosice IT Valley to be established) to the actual one who has been appointed officially in 2014. From 6 appointed directors only 2 had manage to fulfill 3 years<sup>4</sup> in executive position. When Director 3 and Director 4 are compared with reference to amount of members in their period, there are some differences. For the Director 3, number of members was increasing only in the beginning, later it become stable, or even start decreasing slowly. For Director 4, number of members increased over all 3 years. The reasons for such a situation can be discussed in deep detail, just to state some points:

- Director 3 took his position in the period when cluster was stabilizing,
- Aim of the Director 3 was not to increase number of members,
- Management of cluster had took different direction which was not attractive for members/potential members and
- different background of directors – academia vs. business.

Financial data support what non-financial data are showing. As Graph 3 is showing annual budget of Kosice IT Valley has been increasing over the time. Increase has been quite stable, with one exception, year 2012. In that year, budget jumped up due to the financial support scheme for clusters, as mentioned above. On the other hand, year 2011 is showing slow decrease which is in line with small decrease in number of members/active members. Trend line clearly show positive trend in budget for Kosice IT Valley.

<sup>4</sup> Executive director is appointed by General Assembly for the period of 3 years according to Statute.

### % Increase of Annual Income for Kosice IT Valley

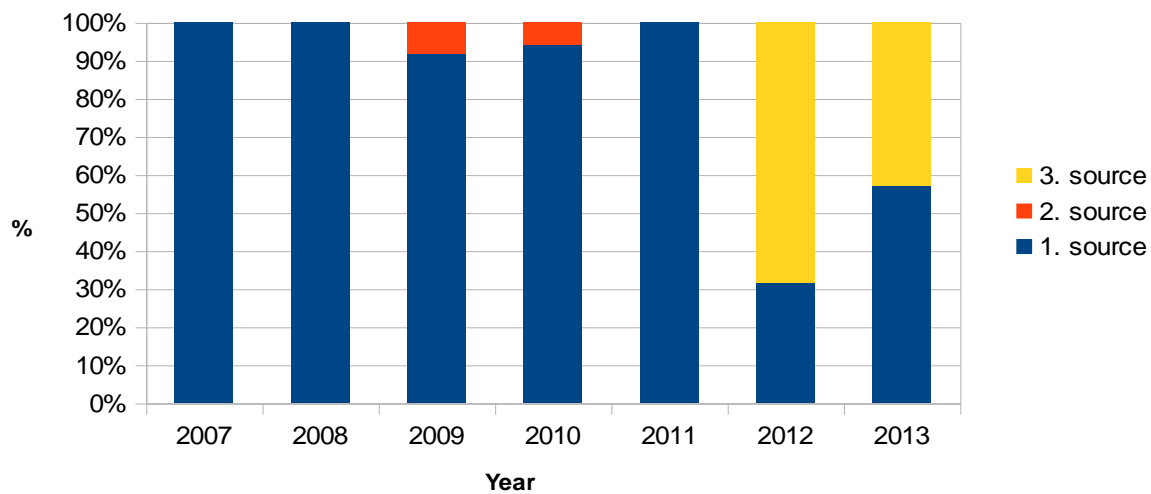


**Graph 3 Increase of Annual Income for Kosice IT Valley [%]**

Not only final number in budget line is important, but also number of sources. With more sources of possible income, organisation become more stable in financing. With more sources of financing more freedom and innovation can be included in planning of future actions for cluster. With multi-sourced financing, members are more focusing on possible outcomes and idea of itself which can help to introduce novelties and add more innovation to cluster activities.

Kosice IT Valley was heavily depended on membership fees. No other source of financing was available in the time cluster was created (see Graph 5). No change occurred in financial model up to 2009. In 2009, for the first time, financing other than membership fees has occurred. This second source has been mostly based on own activities producing income or paid services for members. Starting year 2012 Kosice IT Valley had entered field of projects – national projects and EU based projects, e.g. public financing. All three sources of financing were not present at once in annual budget up to 2013. As partial numbers are showing, year 2014 will be first year for Kosice IT Valley, where real 3-sources financial model will be achieved.

### % of Different Type of Financing of Kosice IT Valley



Graph 4 Ratio of Different Type of Financing for Kosice IT Valley

## 5 Concluding Remarks

Amount of members is probably the first thing that is discussed when talked about clusters. The number itself do not have a strong base of argument, but with connection to other data, such as number of active members and financial data (sources of financing, overall annual budget) can clearly show how developed cluster is. Membership model become over the years more complicated what mirror more complex and wide range of members of the cluster. As Kosice IT Valley has developed over the time, its activities have increased in numbers, in areas of interest but also in quality. More members become an active part of cluster and its activities. Also financial model has changed, from depended only on membership fees to 3 pillars (membership fees, own activities, public financing).

In previous sections we have discussed shortly ecosystem of clusters in Slovakia and Kosice IT Valley as an example of Slovak technological cluster. Internal analysis of variables available for cluster show positive trend in cluster development. We also can conclude, that real data of cluster performance indicating positive trend of development in cluster and all assumptions are stated well. Conclusion can be made, that cluster achieved certain level of maturity.

Level of maturity can be asses in many ways. We have decided to use European wide model based on benchmarking and quality audit executed by ECEI. By external assessment, Kosice IT Valley manage to succeed to fulfill criteria of Bronze Label in the beginning of 2013. Internal analysis shows, that cluster is matured on certain level, external assessment quantifying level of the maturity on bronze.

Active participation and financial model is changing as cluster goes more mature from low level of involvement of members to higher and from one source financial model to multi-source financing. Clusters are complex and dynamic structures that are subject to continuous



change. Strong clusters can promote economic growth through leveraging the innovation and business potential of a region. Main engine for these clusters are active members and members actively involved in cluster activates. Activities of cluster are at one hand motivating other members to become more active and also attract new members, on the other hand make financing of the cluster more stable and increasing in numbers of sources and amount.

More detailed work with data available for the cluster should be carried out in a future to see any possible dependences and hidden connections within cluster which can impact maturity. Also more detailed analysis of qualitative and quantitative data from cluster members on their involvement in cluster should be looked at.

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## References

- Annual report of Kosice IT Valley. 2007. Kosice. Kosice IT Valley.
- BALOG, M., DUMAN, P. 2010. Clustering – A Premise to Success. Bratislava. Slovak Inovation and Energetic Agency. Available online: <http://www.siea.sk/klastre-na-slovensku/> (in Slovak)
- CHLEBÍKOVÁ, D., MRÁZIKOVÁ, J. 2009. Clusters – A New Form of Regions Development in Slovakia. In: Theoretical and Empirical Researches in Urban Management. Number 2 (11). pp. 134-142. Available online: <http://um.ase.ro/no11/11.pdf>
- PORTER, M.E. 1998, The Competitive Advantage of Nations. Free Press
- SEMI, K. 1993. Password – English Dictionary for Speakers of Slovak. Bratislava. SPN.
- SOKOL, M. 2013. Silicon Valley in Eastern Slovakia? Neoliberalism, Post-Socialism and the Knowledge Economy. In: Europe-Asia Studies. Vol. 65. No.7. pp.1324 – 1343. Taylor and Francis
- SOLVELL, O., LINDQUIST, G., KETELS, C. 2003. The Cluster Initiative Greenbook. Available online: <http://www.cluster-research.org/greenbook.htm>