MONITORING "MASS CUSTOMIZATION" AND "OPEN INNOVATION" ON THE WORLD WIDE WEB: A USAGE ANALYSIS 2012-2016

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Abstract: *Mass Customization and Open Innovation attract a noticeable attention for research and appliance during the last three decades. Academic researchers, practitioners and companies make severe efforts to perform a progress in implementing Mass Customization and Open Innovation in business processes. The set question in this paper is simple: How often are published the terms of "Mass Customization", "Open Innovation", "Lean Manufacturing", "Flexible Manufacturing Systems" and "Lean Flow" on the World Wide Web? The current paper conducts a usage analysis for the above mentioned terms from June 2012 till April 2016. The analysis gives statistical results for the usage of these terms, the trend of publication of these terms and several pieces of information concerning the rate and the ratio of their publication activity on the World Wide Web. The data were recorded by using the detection and notification service of Google Alerts.*
Key Words: Mass Customization, Open Innovation, Usage Analysis, Web Analytics, Monitoring Service, Change Detection and Notification

1. INTRODUCTION

The apliance of web analytics on specific terms from the literature is the main idea of the current paper. These terms are considered by literature as interrelated entities [1][2][3]. In particular, Flexible Manufacturing Systems are manufacturing systems that utilize numerically controlled machines, which are flexible enough to satisfy a desired flexibility for Lean Manufacturing and/or Mass Customizers [4][5]. Additionally, Mass Customization is considered to be the next phase after Lean Manufacturing in production systems development [6]. Furthermore, Lean Flow is introduced as a method of Lean Manufacturing and it could be used from Mass Customizers [7]. Lastly, Open Innovation contains the main idea of customer driven value creation and it is necessary for achieving Mass Customization [8]. The monitoring of these terms on the Internet could be valuable for the academia and the industry as well [9][10][11].

2. METHODOLOGY

Monitoring specific terms on the Internet is conducted for research purpose. Part of this research, including results from a period of 2012 till 2014, was previously publicized [12].

The technology that is used for this research refers below. Many software packages and algorithms, which can provide such analysis, are available on the Internet or in the market [13][14][15][16][17][18]. The software, which is chosen for this research, is the Change Detection and Notification service from the search engine "Google", which is named "Google Alerts", and it is a server with a web browser user interface [19][20]. It provides a content service that sends email notifications to users when a specific term, which is given by the users, is publicized on the Internet, namely on web pages, blogs, articles, scientific papers and etc. around the world in a specific language, which the user defines [21]. Primary target of this service is to find just the event of change and not the web page or domain or the location, where the change was occurred. The monitor content of change can include a change on a text, document, script or graphical content. The user needs to have a "Google Account" in order to utilize "Google Alerts". By opening the web page of "Google Alerts", the user inserts key words in the field for searching and automatically receives a sample of web pages, which contains these key words. He or she presses the button "show options" and chooses the desired options and parameters. After that he or she can click on the button "CREATE ALERT". In the current research, the following options for all the terms were chosen:

- "As-it-happens" for "How often"
- "Automatic" for "Sources"
- "English" for "Language"
- "Any Region" for "Region"
- "All Results" for "How many"

The notifications were collected in user's Google Email address. In "Google Email" were used filters for each monitored key word in order to collect and group the new coming notification emails from "Google Alerts" per each term. After the desired period of

monitoring (2012-2016), the emails were transferred into the cross-platform email "Mozilla Thunderbird". The reason was to interpret the data of notification emails into "xml" format and to insert them into "MS Excel" spreadsheets for further analysis. The statistical analysis and the results of it were the two last steps of this research.

3. CHANGE DETECTION AND NOTIFICATION

The following abbreviations of the terms are in use:
- Flexible Manufacturing Systems – FMS
- Lean Flow – LF
- Lean Manufacturing – LM
- Mass Customization – MC
- Open Innovation – OI
- Change Detection and Notification – CDN

The research ran for 1412 days, from 15/06/2102 till 17/05/2016.

3.1. Statistics from daily CDN events

Open Innovation (OI) has the most CDN Events with 4098 events, Lean Manufacturing (LM) with 2830 events, Mass Customization (MC) with 2642 events, Lean Flow (LF) with 229 events and Flexible Manufacturing Systems (FMS) with 129 events, see below Table 1 and Figure 1. FMS and LF were the two less popular terms, with 1% and 2%, respectively. MC and LM share almost the same popularity 27% and 29%, respectively and OI is the most popular term with 41%, see below Figure 2. More terms for Lean Manufacturing are in use on the Internet and in the literature, such as Lean Production, Lean Management, Lean Thinking and etc. The current analysis measures only the CDN Events of the term "Lean Manufacturing". For reasons of accuracy the aforementioned terms could be included in a future research of monitoring overall "Lean" on the Internet.

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Table 1. *Statistical results of daily CDN Events per term*

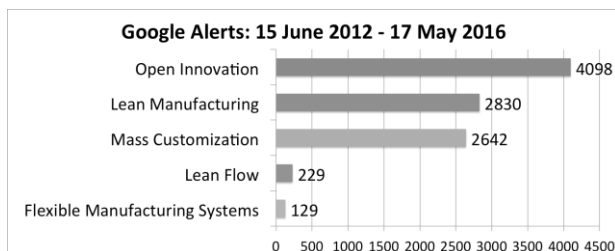|	**FMS**	**LF**	**MC**	**LM**	**OI**
Total	129	229	2642	2830	4098
Count	116	211	1066	1177	1279
Min	0	0	0	0	0
Max	3	3	9	10	12
Mode	0	0	1	1	2
Average	0.09	0.16	1.87	2	2.9
Standard Deviation	0.32	0.4	1.71	1.53	2.08

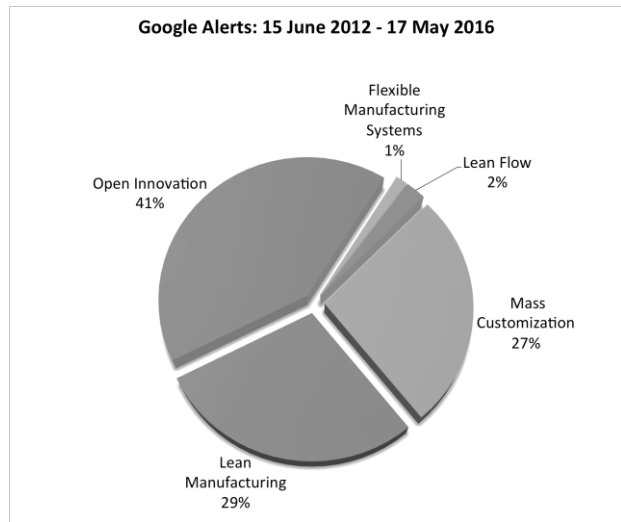Fig. 1. Total *CDN Events: 15 June 2012 – 17 May 2016*

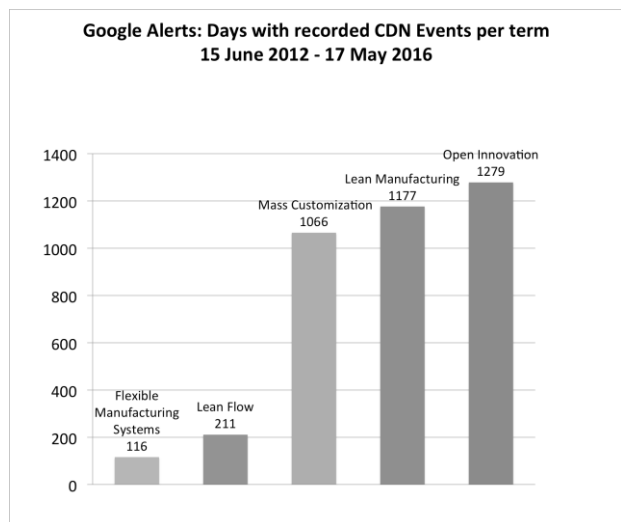Fig. 2. Total *CDN Events – Pie Chart: 15 June 2012 – 17 May 2016*

Fig. 3. Total *CDN Events – Pie Chart: 15 June 2012 – 17 May 2016*

CDN Events of OI were recorded in 116 days, namely 8.22% of the whole research days, 211 days (14.94%) for LF, 1066 days (75.5%) for MC, 1177 days (83.36%) for LM and 1279 days (90.58%) for OI, which means that almost every day at least one CDN Event was recorded, see above Table 1 and Figure 3. There were days, in which no any CDN Event was recorded and the minimum number of records in one day of all the terms is 0, see above Table 1. The average of CDN Events per day was 0.09 events/day for FMS, 0.16 events/day for LF, 1.87 events/day for MC, 2 events/day for LM and 2.9 events/day for OI. The fluctuation rate of daily events for every term is expressed through Standard Deviation, see Table 1.

The following diagrams depict the daily CDN Events during the research period, see below Figures 4 – 8. The statistical results are gathered in Table 1.
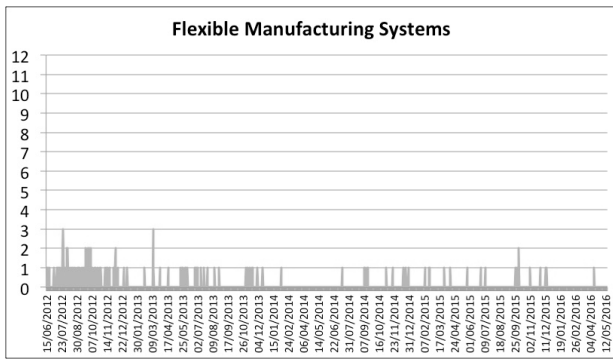
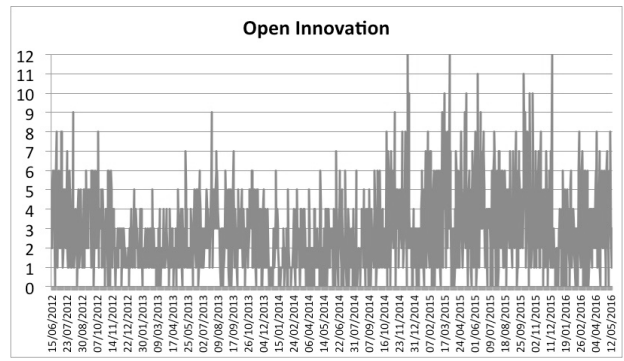*Fig. 4.Flexible Manufacturing Systems: Daily CDN Events*
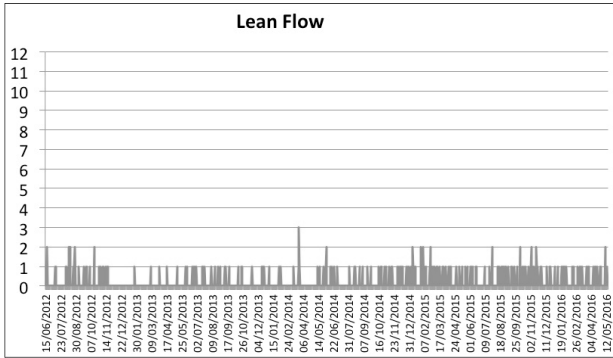

Fig. 5. Lean Flow: Daily CDN Events
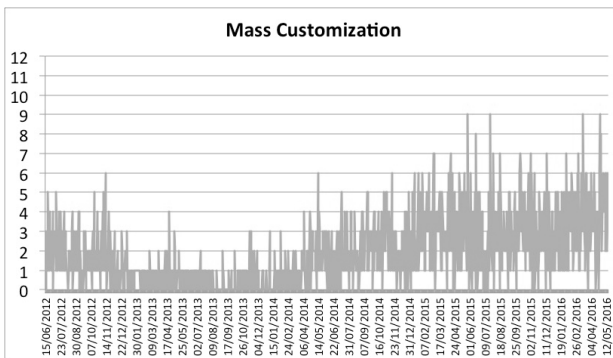
Fig. 6. Mass Customization: Daily CDN Events

Fig. 7. Lean Manufacturing: Daily CDN Events

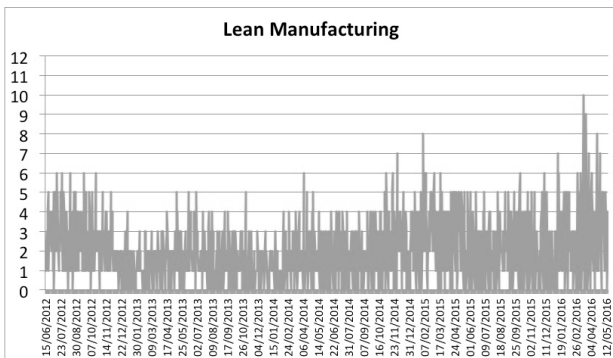*Fig. 8.Open Innovation: Daily CDN Events*

The polynomial trendlines of daily Events are depicted in Figure 9. In the middles of 2012 till middles 2013 all the terms face a downward tendency. An upward tendency for all the terms is obvious from 2014. But the rate of change is different. On the one hand, the trend for LM, MC and OI is rapidly upwards. On the other hand, LF and FMS express a downward trend. It is interesting to be mentioned that the CDN Events of MS in 2012 were less than the CDN Events of LM and OI, but in 2016 they were more than those of LM and the trend indicates to overcome those of OI.
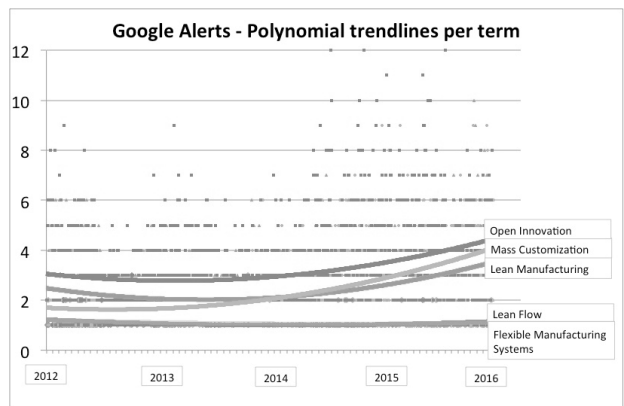

Fig. 9. Polynomial trendlines of daily CDN Events per term

Linear trendlines of daily CDN Events are depicted in Figure 10. The upward trend for LM, MC and OI is clearly displayed. Nowadays, MC is over LM and its trend is to overcome the OI.
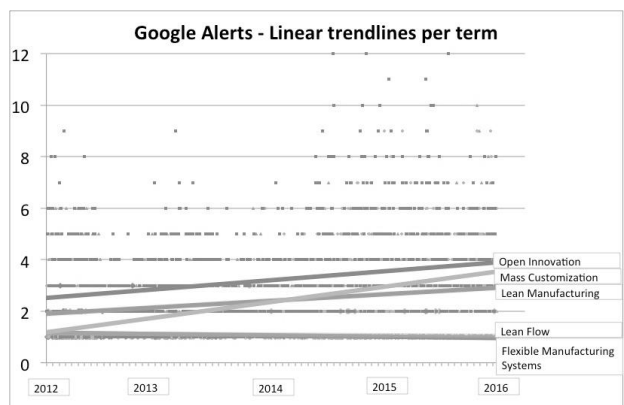

Fig. 10. Linear trendlines of daily CDN Events per term

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The CDN Events were grouped into semesters in order to gain a better picture of the changing rate of each term, see below Table 2. MC gains the third position of the five terms, but in the second semester of 2014 MC crosses over LM and the trend remains incremental. OI has the most CDN Events but in the first semester of 2016 MC wins more popularity than OI, 482 and 431 recorded events, respectively. LF remains quite stable but FMS is "faded". FMS is an old term and according to this research, it seems also blasé and an indifferent term. A comparison diagram among the terms displays these results, see below in Figure 11.

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Table 2. *Total CDN Events per semester*

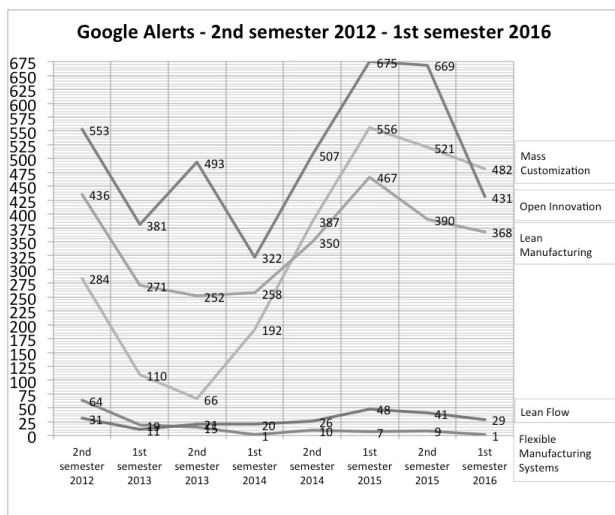| Semester	FMS	LF	MC	LM	OI
2nd 2012	64	31	284	436	553
1st 2013	19	11	110	271	381
2nd 2013	15	21	66	252	493
1st 2014	1	20	192	258	322
2nd 2014	10	26	387	350	507
1st 2015	7	48	556	467	675
2nd 2015	9	41	521	390	669
1st 2016	1	29	482	368	431

Fig. 11. Total CDN Events per semester

3.2. Statistics from total CDN events per hour

A deeper and more detailed analysis of CDN Events follows. CDN Events are analyzed in events per hour for each semester starting from the second semester of 2012 and ending with the first semester of 2016. The time zone of the displayed results is the Central/Middle European Summer Time (CET/MET), namely UTC/GMT +1 hour.

In the 2nd semester of 2012, 553 CDN Events were recorded for OI, which were the most events comparing to other terms. The fewest events were recorded for LF, see below Table 3 and Figure 12. In a further analysis, the total number of events in peak hours were 6, 4, 28, 24 and 34 for each term, respectively. These numbers represent the 9%, 13%, 8%, 7% and 6% of the total recorded events of each term respectively, in this semester. The peak hours of recorded events on the Internet were between 12:00-12:59 and 16:00-16:59 for FMS, 20:00-20:59 for LF and MC, 17:00-17:59 for LM

and between 13:00-13:59 for OI. The rate of an occurrence per hour is very low for all terms, 0.01 events per hour for FMS, 0.001 events per hour for LF, 0.1 events per hour for MC and the same for LM and 0.13 events per hour for OI, see below Table 3.

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Table 3. *Statistical results of hourly CDN Events: 2nd semester 2012*

	FMS	LF	MC	LM	OI
Total	64	31	290	430	553
Total Events in Peak Hours	6	4	28	24	34
% of Total in Peak Hours	9%	13%	8%	7%	6%
Peak Hours	12:00-12:59 16:00-16:59	20:00-20:59	20:00-20:59	17:00-17:59	13:00-13:59
Average / Hour	0.01	0.001	0.1	0.1	0.13

The fluctuations of total CDN events per hour for each term in 2nd semester of 2012 are displayed below in a diagram, see Figure 12.
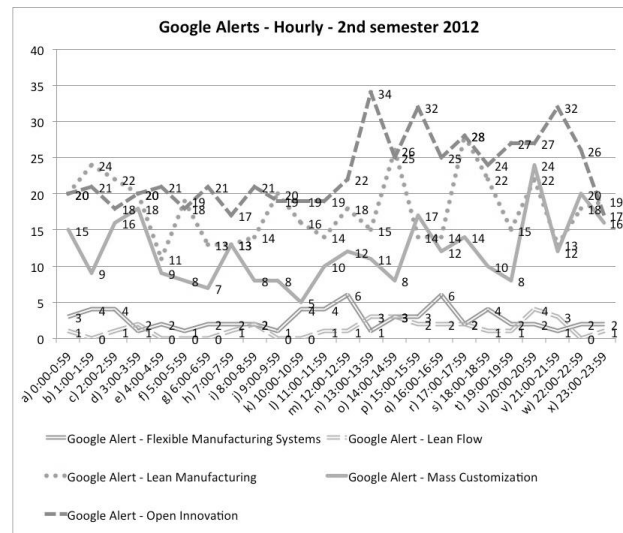

Fig. 12. 2nd semester 2012: Hourly CDN Events

In the 1st semester of 2013, 381 CDN events were recorded for OI, which were the most CDN Events. The fewest events were recorded for LF, see below Table 4 and Figure 13. Total number of events in peak hours were 3, 3, 10, 21 and 24 for each term, respectively. These numbers represent 16%, 27%, 9%, 8% and 6% of the total recorded events of each term, respectively. The peak hours of occurrences were between 00:00-00:59 for FMS, 16:00-16:59 for LF, 19:00-19:59 for MC, 16:00-16:59 and 21:00-21:59 for LM and between 20:00-20:59 for OI. The rate of an occurrence per hour is very low for all the terms, 0.001 events per hour for FMS, 0.001 events per hour for LF, 0.03 events per hour for MC, 0.06 events per hour for LM and 0.09 events per hour for OI, see below Table 4.

Table 4. *Statistical results of hourly CDN Events: 1st semester 2013*

	FMS	LF	MC	LM	OI
Total	19	11	110	271	381
Total Events in Peak Hours	3	3	10	21	24
% of Total in Peak Hours	16%	27%	9%	8%	6%
Peak Hours	00:00-00:59	16:00-16:59	19:00-19:59	16:00-16:59 21:00-21:59	20:00-20:59
Average / Hour	0.001	0.001	0.03	0.06	0.09

Table 5. *Statistical results of hourly CDN Events: 2nd semester 2013*

	FMS	LF	MC	LM	OI
Total	15	21	66	252	493
Total Events in Peak Hours	3	8	10	20	70
% of Total in Peak Hours	20%	38%	15%	8%	14%
Peak Hours	11:00-11:59 19:00-19:59	07:00-07:59	23:00-23:59	12:00-12:59 16:00-16:59	16:00-16:59
Average / Hour	0.001	0.001	0.02	0.06	0.11

The fluctuations of total CDN events per hour for each term in 1st semester of 2013 are displayed below in diagram Figure 13. A strong activity for the well established terms OI and LM is reported in afternoons.
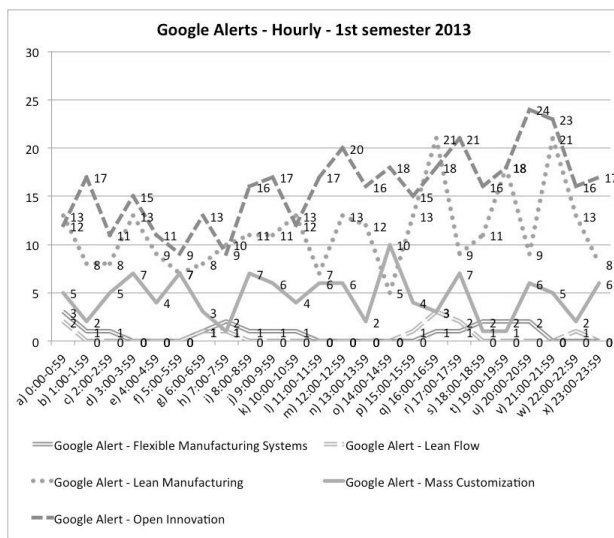

Fig. 13. 1st semester 2013: Hourly CDN Events

In 2nd semester of 2013, 493 CDN Events were recorded for OI, which were the most events. The fewest events were recorded for FMS, see below Table 5 and Figure 14. The total number of events in peak hours for this semester were 3, 8, 10, 2 and 70 for each term, respectively. These numbers represent 20%, 38%, 15%, 8% and 14% of total recorded events for each term, respectively. The peak hours of occurrences were happened between 11:00-11:59 and 19:00-19:59 for FMS, 07:00-07:59 for LF, 23:00-23:59 for MC, 12:00-12:59 and 16:00-16:59 for LM and 16:00-16:59 for OI. The rate of an occurrence per hour is also very low for all the terms, 0.001 events per hour for FMS and LF, 0.02 events per hour for MC, 0.06 events per hour for LM and 0.11 events per hour for OI, see below Table 5.

The fluctuations of total CDN events per hour for each term in 2nd semester of 2013 are displayed below in a diagram, see Figure 14. A sudden and intent activity for OI was reported during afternoons. The diagram shows a periodical activity of events every 4 hours for OI and the same for LM.
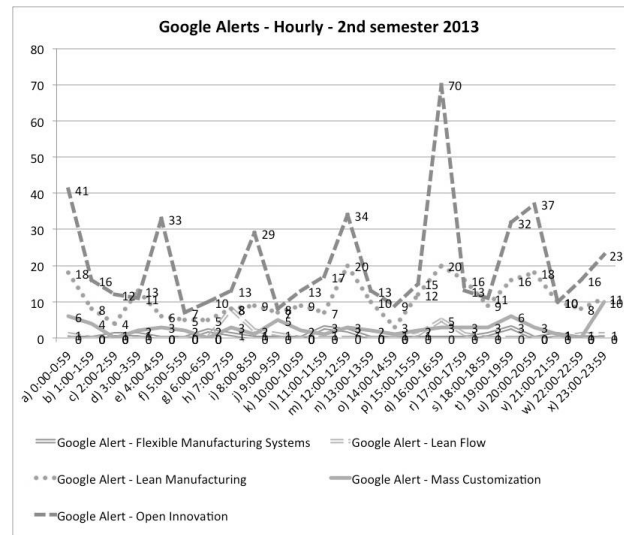

Fig. 14. 2nd semester 2013: Hourly CDN Events

In 1st semester of 2014, 322 CDN events were recorded for OI, which were the most events. The fewest events are recorded for FMS, see below Table 6 and Figure 15. FMS popularity starts to fade from this semester. The total number of events in peak hours were 1, 3, 26, 12 and 25 for each term, respectively. These numbers represent 100%, 15%, 6%, 10% and 6% of total recorded events for each term, respectively. The peak hours of occurrences were active between 11:00-11:59 with only one event for FMS, 10:00-10:59 and 20:00-20:59 for LF, 18:00-18:59 for MC, 17:00-17:59 and 20:00-20:59 for LM and between 17:00-17:59 for OI. The rate of an occurrence per hour is also very low for all the terms, 0.001 events per hour for FMS and LF, 0.04 events per hour for MC, 0.06 events per hour for LM and 0.07 events per hour for OI, see below Table 6.

Table 6. *Statistical results of hourly CDN Events: 1st semester 2014*

	FMS	LF	MC	LM	OI
Total	1	20	192	258	322
Total Events in Peak Hours	1	3	26	12	25
% of Total in Peak Hours	100%	15%	6%	10%	6%
Peak Hours	11:00-11:59	10:00-10:59 20:00-20:59	18:00-18:59	17:00-17:59 20:00-20:59	17:00-17:59
Average / Hour	0.001	0.001	0.04	0.06	0.07

Table 7. *Statistical results of hourly CDN Events: 2nd semester 2014*

	FMS	LF	MC	LM	OI
Total	10	26	387	350	507
Total Events in Peak Hours	2	3	25	28	32
% of Total in Peak Hours	20%	12%	6%	8%	6%
Peak Hours	13:00-13:59 18:00-18:59	20:00-20:59 21:00-21:59	16:00-16:59	19:00-19:59	18:00-18:59
Average / Hour	0.001	0.001	0.09	0.08	0.12

The fluctuations of total CDN events per hour for each term in 1st semester of 2014 are displayed below in a diagram, see Figure 15. A sudden and intent activity for LM is reported during morning hours. The diagram shows an increased activity during afternoons for OI and LM. The events of MC are occurred with a regular pace as shown below in Figure 15.
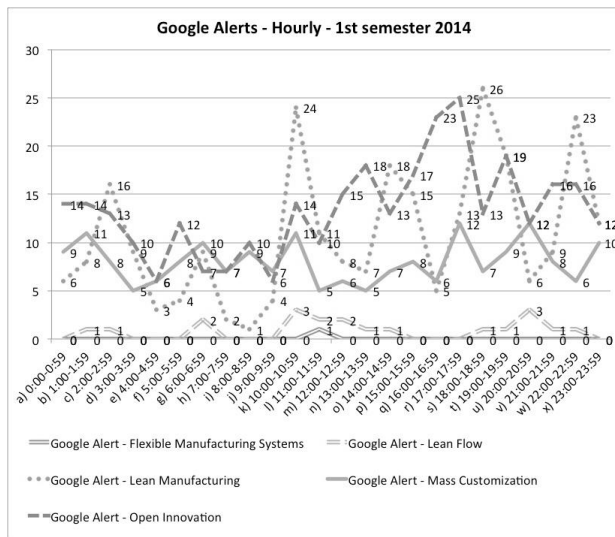

Fig. 15. 1st semester 2014: Hourly CDN Events

Referring to the 2nd semester of 2014, 507 CDN Events were recorded for OI, which are the most events. The fewest events were recorded for FMS, see below Table 7 and Figure 16. The total number of events in peak hours were 2, 3, 25, 28 and 32 for each term, respectively. These numbers represent 20%, 12%, 6%, 8% and 6% of total recorded events for each term, respectively. The peak hours of activity were active between 13:00-13:59 and 18:00-18:59 for FMS, 20:00-21:59 for LF, 16:00-16:59 for MC, 19:00-19:59 for LM and between 18:00-18:59 for OI. The rate of an occurrence per hour continues to be low for all terms, 0.001 events per hour for FMS and LF, 0.09 events per hour for MC, 0.08 events per hour for LM and 0.12 events per hour for OI, see below Table 7.

The fluctuations of total CDN events per hour for each term in 2nd semester of 2014 are displayed below in diagram Figure 16. The diagram shows an increased activity during afternoons for OI, MC and LM.
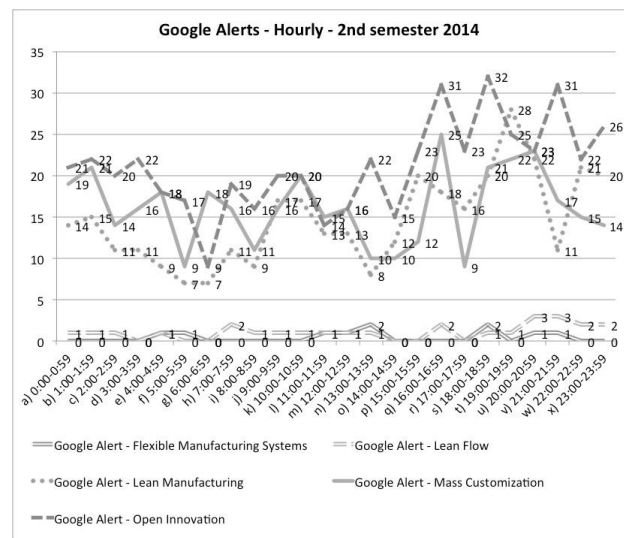

Fig. 16. 2nd semester 2014: Hourly CDN Events

In 1st semester of 2015, 675 CDN events were recorded for OI, which were the most CDN Events. The fewest events were recorded for FMS, see below Table 8 and Figure 17. The total number of events during peak hours were 3, 7, 43, 42 and 47 for each term, respectively. These numbers represent 43%, 15%, 8%, 9% and 7% of total recorded events for each term, respectively. The peak hours were between 11:00-11:59 for FMS, 02:00-02:59 for LF, 18:00-18:59 for MC, 15:00-15:59 and 21:00-21:59 for LM and between 16:00-16:59 for OI. The rate of an incident per hour is low for all terms, 0.001 events per hour for FMS, 0.01 events per hour for LF, 0.13 events per hour for MC, 0.11 events per hour for LM and 0.16 events per hour for OI, see below Table 8.

Table 8. *Statistical results of hourly CDN Events: 1st semester 2015*

	FMS	LF	MC	LM	OI
Total	7	48	556	467	675
Total Events in Peak Hours	3	7	43	42	47
% of Total in Peak Hours	43%	15%	8%	9%	7%
Peak Hours	11:00-11:59	02:00-02:59	18:00-18:59	15:00-15:59 21:00-21:59	16:00-16:59
Average / Hour	0.001	0.01	0.13	0.11	0.16

Table 9. *Statistical results of hourly CDN Events: 2nd semester 2015*

	FMS	LF	MC	LM	OI
Total	9	41	521	390	669
Total Events in Peak Hours	2	5	55	46	55
% of Total in Peak Hours	22%	12%	11%	12%	8%
Peak Hours	17:00-17:59	18:00-18:59	18:00-18:59	22:00-22:59	18:00-18:59
Average / Hour	0.001	0.01	0.12	0.09	0.15

The charts of total CDN events per hour for each term in 1st semester of 2015 are displayed below in diagram Figure 17. A sudden and intent activity for LM is reported during morning hours. The high fluctuations express an acute activity during afternoons for MC, LM and OI.
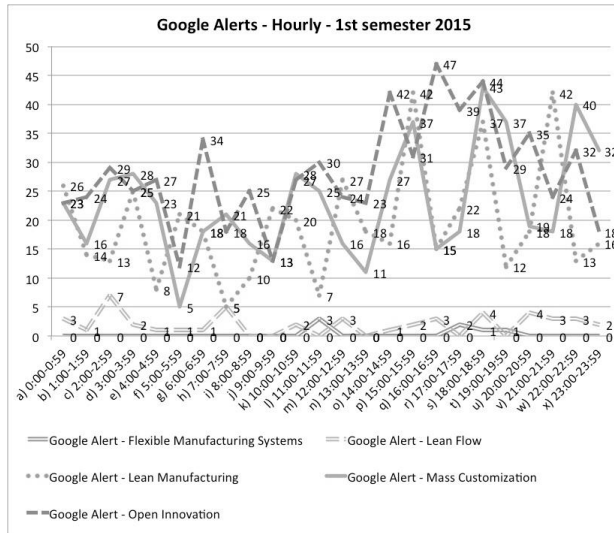

Fig. 17. 1st semester 2015: Hourly CDN Events

In 2nd semester of 2015, 669 CDN events were recorded for OI, which were the most CDN Events. The fewest events were recorded for FMS, see below Table 9 and Figure 18. Total number of events during peak hours were 2, 5, 55, 46 and 5 for each term, respectively. These numbers represent 22%, 12%, 11%, 12% and 8% of the total recorded events of each term, respectively. The peak hours of occurrences were between 17:00-17:59 for FMS, 18:00-18:59 for LF and MC, 22:00-22:59 for LM and between 18:00-18:59 for OI. The rate of an occurrence per hour is very low for all the terms, 0.001 events per hour for FMS, 0.01 events per hour for LF, 0.12 events per hour for MC, 0.09 events per hour for LM and 0.15 events per hour for OI, see below Table 9.

The fluctuations of total CDN events per hour for each term in 2nd semester of 2015 are displayed below in a diagram, see Figure 18. An intent activity for OI and MC was reported during afternoons.
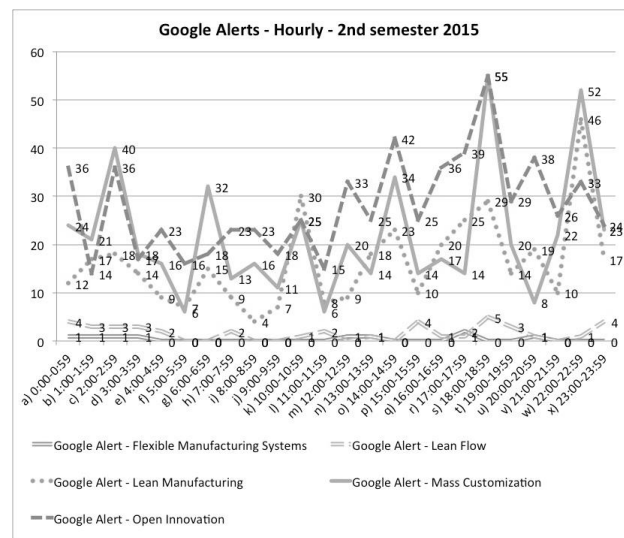

Fig. 18. 2nd semester 2015: Hourly CDN Events

During last semester of the occurred analysis, which is the 1st semester of 2016, 431 CDN events were recorded for OI, which were the most events. The fewest events were recorded for FMS, see below Table 10 and Figure 19. Total number of events in peak hours were 1, 5, 44, 30 and 31 for each term, respectively. These numbers represent 100%, 17%, 9%, 8% and 7% of total recorded events of each term, respectively. The peak hours of occurrences were between 22:00-22:59 for FMS, 09:00-09:59 and 17:00-17:59 for LF, 18:00-18:59 for MC, 15:00-15:59 for LM and between 19:00-19:59 for OI. The rate of an occurrence per hour is low for all the terms, 0.001 events per hour for FMS, 0.07 events per hour for LF, 0.11 events per hour for MC, 0.09 events per hour for LM and 0.01 events per hour for OI, see below Table 10.

Table 10. *Statistical results of hourly CDN Events: 1st semester 2016*

	FMS	LF	MC	LM	OI
Total	1	29	482	368	431
Total Events in Peak Hours	1	5	44	30	31
% of Total in Peak Hours	100%	17%	9%	8%	7%
Peak Hours	22:00-22:59	09:00-09:59 17:00-17:59	18:00-18:59	15:00-15:59	19:00-19:59
Average / Hour	0.001	0.007	0.11	0.09	0.1

The fluctuations of total CDN events per hour for each term during the 1st semester of 2016 are displayed below in a diagram, see Figure 19. A stable pace of activity for MC was recorded, namely a four-hours pace.
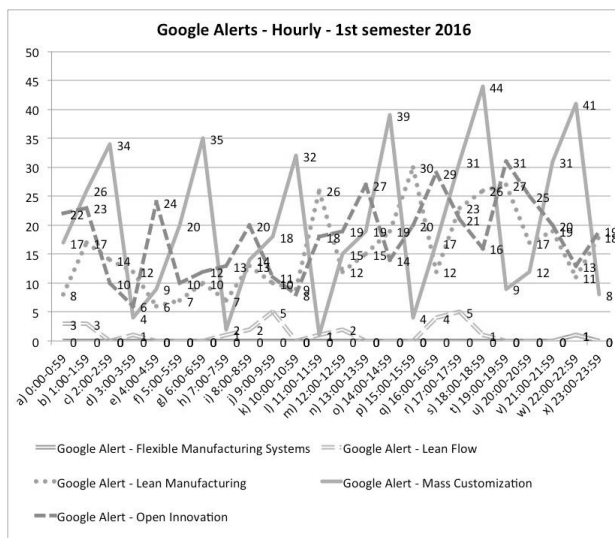

Fig. 19. 1st semester 2016: Hourly CDN Events

During the last semester, which is the 1st of 2016, 431 CDN events were recorded for OI, which were the most CDN Events. The fewest events were recorded for FMS, see below Table 10 and Figure 19. Total number of events in peak hours were 1, 5, 44, 30 and 31 for each term, respectively. These numbers represent 100%, 17%, 9%, 8% and 7% of total recorded events of each term, respectively. The peak hours of occurrences were between 22:00-22:59 for FMS, 09:00-09:59 and 17:00-17:59 for LF, 18:00-18:59 for MC, 15:00-15:59 for LM and between 19:00-19:59 for OI. The rate of an occurrence per hour is low for all the terms, 0.001 events per hour for FMS, 0.07 events per hour for LF, 0.11 events per hour for MC, 0.09 events per hour for LM and 0.01 events per hour for OI, see below Table 10.

Table 11. *Total hourly CDN Events per term*

	FMS	LF	MC	LM	OI
a) 0:00-0:59	7	15	120	120	194
b) 1:00-1:59	7	9	111	113	154
c) 2:00-2:59	7	13	145	107	153
d) 3:00-3:59	3	8	100	118	130
e) 4:00-4:59	3	4	89	61	167
f) 5:00-5:59	2	1	67	78	104
g) 6:00-6:59	5	4	123	87	125
h) 7:00-7:59	5	**20**	79	66	122
i) 8:00-8:59	3	7	82	71	162
j) 9:00-9:59	2	7	87	102	115
k) 10:00-10:59	6	7	129	141	140
l) 11:00-11:59	**12**	7	70	97	143
m) 12:00-12:59	10	9	96	120	187
n) 13:00-13:59	4	6	75	104	182
o) 14:00-14:59	3	5	139	126	180
p) 15:00-15:59	3	11	100	158	178
q) 16:00-16:59	7	20	100	125	**281**
r) 17:00-17:59	7	11	110	155	213
s) 18:00-18:59	10	13	**185**	**182**	214
t) 19:00-19:59	9	7	115	149	212
u) 20:00-20:59	6	15	108	135	225
v) 21:00-21:59	3	10	115	137	185
w) 22:00-22:59	3	10	176	154	176
x) 23:00-23:59	2	10	121	124	156

Table 12. *Statistical results of hourly CDN Events per term*

	FMS	LF	MC	LM	OI
Total	129	229	2642	2830	4098
Total Events in Peak Hours	12	20	185	182	281
% of Total in Peak Hours	9%	9%	6%	7%	7%
Peak Hours	11:00-11:59	07:00-07:59	18:00-18:59	18:00-18:59	16:00-16:59
Average / Hour	0	0	0.08	0.08	0.12

The polynomial trendlines of total CDN Events per hour for the period between half of 2012 and half of 2016 are depicted in Figure 20. The terms MC, LM and OI express an upward tendency from afternoon and for the rest hours. OI recorded the most CDN events and LM, MC, LF and FMS follow.
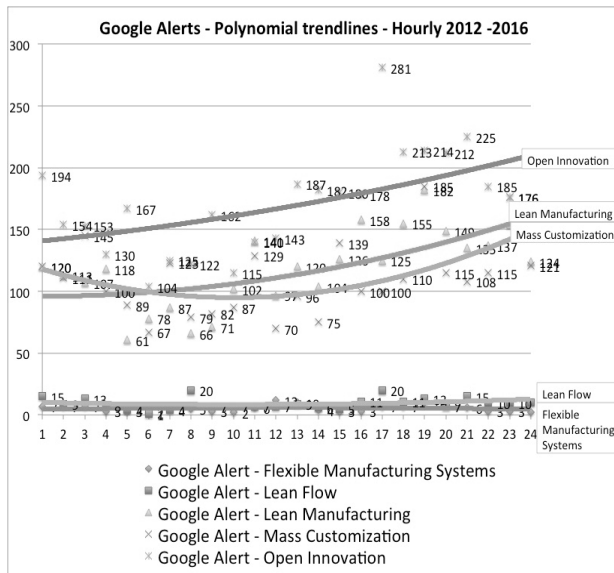
Fig. 20. Polynomial trendlines of hourly CDN Events per term

Linear trendlines of total CDN Events per hour for each term are depicted in Figure 21. The upward trend from afternoon for LM, MC and OI is clearly displayed.
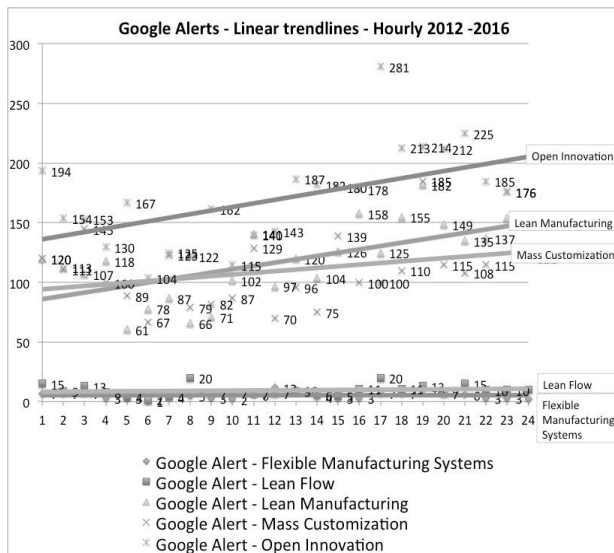

Fig. 21. Polynomial trendlines of hourly CDN Events per term

4. CONCLUSION

Five terms, which share a common frame of interest for academia and industry, were chosen to be monitored on the Internet. The statistical results of this study are presented above. The term "Flexible Manufacturing Systems" is an old term and its use on the Internet is low with a downward tendency, with a slope of its trendline to be minus 0.00018. The term "Lean Flow" is quite a new term, which has some recorded CDN Events but not as many as the rest three well established terms. Its slope is 0.0001. The records of "Lean Manufacturing" show fewer CDN Events than those of "Mass Customization" but during the last years, its tendency is reversed. "Lean Manufacturing gains bigger share than "Mass Customization", concerning their Change Detection and Notification on the Internet. Both of them express an

upward tendency in events. The slope of MC is 0.00213 and the slope of LM is 0.00053. The term "Lean" refers to "Lean Production", "Lean Thinking", "Lean Hospital" and "Lean Management". In the current research the term "Lean Manufacturing" was selected to be researched. In the same way, the term "Mass Customization" is expressed also by other terms, such as "configurator", "customization", "personalization" and "individualization". In the current research only the term "Mass Customization" was selected to be studied. For future and more accurate research activity, more terms, such as the aforementioned, could be investigated. Moreover, even more accurate results could be reached through a further research by using requirements of Online Reputation analysis [22]. The term "Open Innovation" is the most well established term and the tendency of its events incised upwards. Its slope is 0.00079. This slope is lower than LM's slope.

"Lean Manufacturing", "Open Innovation" and "Mass Customization" do currently have and seem also to promise for the immediate future a great interest among the people surfing on the web. This result encourages the Mass Customization and Open Innovation community in continuing its research effort.

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