

CREATING A DASHBOARD USING TABLEAU

Tanya Jain¹, Rashmi Pathak²

^{1,2}Student in ABES Institute of Technology, APJ Abdul Kalam Technical University, Lucknow, U.P.

ABSTRACT - Dashboards- one amongst the foremost common use cases for information visual image and their style and contexts of use square measure significantly completely different from alpha visual image tools. During this paper, we glance at the broad scope of however dashboards square measure employed in follow through associate analysis of dashboard examples and documentation regarding their use. we tend to consistently review the literature encompassing dash board use, construct a design space for dash boards, and identify major dash board types. We tend to characterize dashboards by their style goals, levels of interaction, and therefore the practices around them. Our framework and literature review recommend variety of fruitful analysis directions to higher support dashboard style, implementation, and use.

Index Terms—Dashboards, tableau, survey, style area, open cryptography

MEANING OF DASHBOARD

In data technology, a dashboard is a straightforward to browse, typically single page, period computer programme, showing a graphical presentation of the present standing (snapshot) associated historical trends of an organization's or department's key performance indicators to modify instant and enlightened selections to be created at a look. the concept of digital dashboards emerged from the study of call support systems within the Nineteen Seventies. Business dashboards were initial developed within the Nineteen Eighties, however thanks to the issues with information refreshing and handling, they were placed on the shelf. within the Nineteen Nineties, {the information| the knowledge| the information} age quickened pace and data repositing, and on-line analytical process (OLAP) allowed dashboards to perform adequately. However, the utilization of dashboards didn't become widespread till the increase of key performance indicators (KPIs), and therefore the introduction of Henry M. Robert S. Kaplan and David P. Norton's Balanced book. Today, the utilization of dashboards forms a crucial a part of higher cognitive process.

WHAT IS A DASHBOARD?

Even the definition of a dashboard is in flux. Few [19] describes dashboards narrowly: "a preponderantly visual data show that folks use to apace monitor current conditions that need a timely response to fulfill a specific role." This definition entails single-paged, glance-able views of change information. Wexler et al. [61] supply a broader definition: "a visual show of knowledge wont to monitor conditions and/or facilitate understanding," which may embrace infographic parts or narrative visualizations (such as Figure one right). Through each the domain review and therefore the dashboard style survey, it became clear that the term dashboard is wide wont to refer to several differing types of entities, difficult the dashboard stereotype acquainted to the visual image community. Present information, and visual image technologies out there to the general public, has broadened dashboard adoption to new domains. Consequently, the dashboard conception has evolved from single-view coverage screens to incorporate interactive interfaces with multiple views and functions, together with communication, learning, and motivation, additionally to the classic notions of watching and call support. Broadly, then, we tend to determine 2 completely different major style views. We tend to distinguish between the visual genre of dashboards (a visual information illustration structured as a covered layout of easy charts and/or giant numbers as in Figure one left) and therefore the useful genre (an interactive show that permits period watching of dynamically change data). Whereas several information displays use the acquainted "dashboard" visual look, we tend to found several tools that support constant functions however have terribly completely different visual styles, particularly dashboards meant for mobile devices. we tend to don't conceive to give one authoritative definition of dashboards. Instead, we tend to acknowledge a tension between the visual and useful genres. For the needs of this survey, we tend to aim for inclusivity and take into account a show a dashboard if it matches either the visual genre or the useful genre, or both. Consequent 2 sections explore our understanding of the dashboard area, derived through our style survey and domain review.

KEY METRICS OF DASHBOARD

The core of the dashboard lies within the key metrics needed for observation. Thus, supported whether or not the dashboard is for a corporation on the entire or for a department like sales, finance, human resources, production, etc. the key metrics that square measure needed for show vary. Further, the key metrics for a dashboard conjointly depend upon the role of the recipients (audience). for instance, govt (CEO, CIO, etc.), Operations Manager, Sales Head, Sales Manager, etc. this can be because of the very fact that the first goal of a dashboard in to change information visualisation for higher cognitive process. The success of a dashboard usually depends on the metrics that were chosen for observation. for instance, Key Performance Indicators, Balanced Scorecards and Sales Performance Figures might be the content applicable in business dashboards. Dashboard advantages Dashboard enable managers to observe the contribution of the assorted departments within the organization. to observe the organization's overall performance, dashboards enable you to capture and report specific information points from every of the departments within the organization, providing a pic of current performance and a comparison with earlier performance.

BENEFITS OF DASHBOARDS-

- Visual presentation of performance measures.
- Ability to spot and proper negative trends.
- Measurement of efficiencies/inefficiencies.
- Ability to come up with careful reports showing new trends.
- Ability to form additional hip choices supported collected information.
- Alignment of ways and structure goals.
- Instant visibility of all systems in total.
- Quick identification of knowledge outliers and correlations.
- Time saving with the excellent information visualisation as compared to running multiple reports.

Types of Dashboards

Dash boards may be classified supported their utility as follows -

- Strategic Dashboards
- Analytical Dashboards
- Operational Dashboards
- Informational Dashboards

Strategic Dashboards

Strategic dashboards support managers at any level in a corporation for higher cognitive process. they supply the pic of knowledge, displaying the health and opportunities of the business, that specialize in the high level measures of performance and forecasts.

- Strategic dashboards need to own periodic and static snapshots of knowledge (e.g. daily, weekly, monthly, quarterly and annually). they have not be perpetually ever-changing from one moment to subsequent and need associate update at the required intervals of your time.
- They portray solely the high level information not essentially giving the main points.
- They may be interactive to facilitate comparisons and totally different views just in case of huge information sets at the press of a button. But, it's not necessary to produce additional interactive options in these dashboards.

Analytical Dashboards

Analytical dashboards embody additional context, comparisons, and history. They concentrate on the assorted aspects of knowledge needed for analysis. Analytical dashboards usually support interactions with the information, like drilling down into the underlying details and thus ought to be interactive. Examples of analytical dashboards embody Finance Management dashboard and Sales Management dashboard.

Operational Dashboards

Operational dashboards square measure for constant observation of operations. {they square measure| they're} usually designed otherwise from strategic or analytical dashboards and concentrate on observation of activities and events that are perpetually ever-changing and would possibly need attention and response at a moment's notice.

Informational Dashboards

Informational dashboards are only for displaying figures, facts and/or statistics. They will be either static or dynamic with live information however not interactive. as an example, flights arrival/departure info dashboard in an airdrome.

APPLICATIONS OF DASHBOARD

In parallel with the dashboard survey, we have a tendency to conducted a multi-disciplinary review of dashboards in follow by examining literature coverage case studies, user

studies, style exercises and preparation reports of dashboards utilized in Business Intelligence (BI), Education, Smart Cities, Social Organizations, Health Management, and private Visual Analytics. we have a tendency to note that whereas we have a tendency to didn't directly involve users during this analysis, several of the papers reportable intensive user studies, usually longitudinal investigations. we have a tendency to examined literature primarily outside the fields of mental image and HCI, specializing in papers that represented studies of real-world experiences of victimization dashboards in multiple sectors. Papers in our survey were sourced via Google Scholar and library searches with keywords together with dashboard, mental image, analytics, and observation. Our primary goal with the domain review was to spot challenges associated with dashboard technology and preparation. This review conjointly enlightened our style area and writing terms by characteristic factors that dashboard designers and users contemplate vital in follow. These factors enlightened a number of the writing terms. Most notably, "strategic", "tactical", and "operational" are common functions of dashboards used for decision-making within the business literature [12,18].

DOMAINS AND USES

We have a tendency to normally consider dashboards in business organizations, with goals like optimizing deciding, enhancing operational efficiency, increasing information visibility, driving strategy and transparency, reducing prices, and facilitating communication [23,36,37,65,66]. Dashboards are normally categorized by the kind of decision-making they support: strategic, plan of action or operational [36,39]. Even at intervals business intelligence there's significant diversity in dashboard use. A bismuth dashboard is often currently quite a single-view coverage screen: it's a portal to the knowledge required for a few goal and should serve multiple analytical tasks[12,36,65]. Nonetheless it's outside bismuth that dashboard functions and wishes become even a lot of wide varied. As an example, health organizations are adapting dashboards at each large-scale (hospital management [60]) and patient-care levels with a primary goal of supporting collaboration and awareness across various roles, time-frames and experience. Urban science and community organizations information sources, serving an oversized and various set of stakeholders, adapting to multiple platforms together with mobile devices, and developing metrics and representations to represent intangible outcomes like community awareness, engagement, and trust. Each learning analytics dashboards and private behavior trailing dashboards might

incorporate a social sharing and comparison side, raising eidetic challenges and issues concerning privacy. Across these various domains, dashboard limitations were reflected during a range of common themes. a number of these match current analysis queries within the mental image community, whereas others are novel.

LIMITATIONS

Our work is subject to some caveats. Most significantly, our methodology explored dashboards and their use indirectly through examples and literature. We have a tendency to didn't directly consult dashboard users or styleers and should thus have uncomprehensible some vital design issues, challenges, and potential mismatches between meant and actual system use. Whereas the insights disclosed by the literature do correspond to anecdotal reports we've got detected concerning dashboard use, we have a tendency to contemplate systematic studies involving actual dashboard designers AND shoppers as an particularly vital avenue for future analysis. Additionally, the dashboards examined in our survey were on purpose various however ar by no means that a sample distribution. it's encouraging that our ensuing classes ar semantically meaty and might capture the commonalities at intervals our various assortment. still, we have a tendency to absolutely anticipate that examining extra dashboards, use cases, and domains can reveal new insights and extra classes. in addition, several of our style dimensions and observations might apply to alternative sorts of visual analytic systems; future work might explore these synergies and decide to a lot of clearly delineate the challenges distinctive to dashboards alone. Our style area ought to be taken as a first step instead of a whole characterization; we have a tendency to hope that this work can inspire others to more develop and refine it through various methodologies and complementary examples

CONCLUSION

Our exploration of dashboards took two complementary lenses: a perspective focused on the artefact design (the dashboards survey) and one focused on artefact practices(the domain review). They highlighted design issues and challenges that dashboard designers should consider, many of which pose interesting research questions for the visualization community. The clearest implication of our work is that we need to stop thinking of dashboards as a single entity and actually explore and experiment with design separately for different purposes, contexts of use, and data environments.

REFERENCES

[1] J. Weiner, V. Balijepally, and M. Tanniru. Integrating Strategic and Operational Decision Making Using Data-Driven Dashboards: The Case of St. Joseph Mercy Oakland Hospital. *Journal of Healthcare Management*, 60(5):319. [61] S. Wexler, J. Shaffer, and A. Cotgreave. *The Big Book of Dashboards: Visualizing Your Data Using Real-World Business Scenarios*. John Wiley & Sons, 2017.

[2] M. Whooley, B. Ploderer, and K. Gray. On the Integration of Self-tracking Data amongst Quantified Self Members. pp. 151–160, Sept. 2014. doi: 10.14236/ewic/hci2014.16

[3] B. A. Wilbanks and P. A. Langford. A Review of Dashboards for Data Analytics in Nursing. In *CIN: Computers, Informatics, Nursing*, pp. 545–549, Nov. 2014.

[4] B. Williamson. Digital education governance: data visualization, predictive analytics, and ‘real-time’ policy instruments. In *Journal of Education Policy*, pp. 1–19. Routledge, Jan. 2016. [5] O.M.Yigitbasioglu and O.Velcu. A review of dashboards in performance management: Implications for design and research. *International Journal of Accounting Information Systems*, 13(1):41–59, Mar. 2012. [66] J. Zeng and K. W. Glaister. Value creation from big data: Looking inside the black box. *Strategic Organization*, 36(4):147612701769751–36, Nov.

[6] K. Rall, M. L. Satterthwaite, A. V. Pandey, J. Emerson, J. Boy, O. Nov, and E. Bertini. Data Visualization for Human Rights Advocacy. *Journal of Human Rights Practice*, 8(2):171–197, July 2016.

[7] R. M. Ratwani and A. Fong. Connecting the dots: leveraging visual analytics to make sense of patient safety event reports. *Journal of the American Medical Informatics Association*, 22(2):312–317, 2014.

[8] M. Riphagen. Supporting reflective learning for daily activities using an interactive dashboard. In *ICERI 2013 Proceedings*, pp. 3239–3249. IATED, 2013.

[9] L. D. Roberts, J. A. Howell, and K. Seaman. Give Me a Customizable Dashboard: Personalized Learning Analytics Dashboards in Higher Education. *Technology, Knowledge and Learning*, 22(3):317–333, June 2017.

[10] T. Rogers and A. Feller. Discouraged by peer excellence: Exposure to exemplary peer performance causes quitting. *Psychological Science*, 27(3):365–374, Mar. 2016.

[11] H. J. Schulz, T. Nocke, M. Heitzler, and H. Schumann. A design space of visualization tasks. *IEEE Transactions on Visualization and Computer Graphics*, 19(12):2366–2375, 2013. doi: 10.1109/TVCG.2013.120

[12] H. Tangmunarunkit, C.-K. Hsieh, B. Longstaff, S. Nolen, J. Jenkins, C. Ketcham, J. Selsky, F. Alquaddoomi, D. George, J. Kang, et al. Ohmage: A general and extensible end-to-end participatory sensing platform. *ACM Transactions on Intelligent Systems and Technology (TIST)*, 6(3):38, 2015.

[13] J. Tucker. How is your school doing? online dashboard gives parents new tool. <https://www.sfgate.com/education/article/How-is-your-school-doing-California-School-11001927.php>.

[14] O. Velcu-Laitinen and O. M. Yigitbasioglu. The Use of Dashboards in Performance Management: Evidence from Sales Managers. *The International Journal of Digital Accounting Research*, 12:36–58, 2012.

[15] K. Verbert, E. Duval, J. Klerkx, S. Govaerts, and J. L. Santos. Learning Analytics Dashboard Applications. In *American Behavioral Scientist*, pp. 1500–1509, Sept. 2013.

[16] B. R. Lea and F. H. N. Nah. Usability of Performance Dashboards, Usefulness of Operational and Tactical Support, and Quality of Strategic Support: A Research Framework. *HIMI HCII 2013, Part II, LNCS 8017*, pp. 116–123, June 2013.

[17] H. Lempinen. Constructing a design framework for performance dashboards. In *Nordic Contributions in IS Research*, pp. 109–130. Springer Berlin Heidelberg, 2012.

[18] S. Malik. *Enterprise dashboards: design and best practices for IT*. John Wiley & Sons, 2005.

[19] F. Marx, J. H. Mayer, and R. Winter. Six principles for redesigning executive information systems—findings of a survey and evaluation of a prototype. *ACM Transactions on Management Information Systems*, 2(4):1–19, Dec. 2011.

[20] S. Mattern. Mission Control: A history of the urban dashboard. *Places. The Journal of Public Scholarship on Architecture, Landscape and Urbanism*, pp. 1–20, Mar. 2015.

[21] G. McArdle and R. Kitchin. The Dublin Dashboard: Design and development of a real-time analytical urban dashboard. *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, 4:19, 2016.

[22] C. McCoy and H. Rosenbaum. Unintended and shadow practices of decision support system dashboards in higher education institutions. vol. 54, pp. 757–759. Washington, DC, Oct. 2017.

[23] T. H. S. Morgan, D. Murphy, and B. Horwitz. Police Reform Through Data-Driven Management. In *Police Quarterly*, pp. 275–294, May 2017.

[24] A. Mottus, S. Graf, N.-S. Chen, et al. Use of dashboards and visualization techniques to support teacher decision making. In *Ubiquitous Learning Environments and Technologies*, pp. 181–199. Springer, 2015